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A New Method of Making Joints

Assemblies of Simple Parts, Snugly Fitted, Are Heated in a Hydrogen Atmosphere—Powdered Copper, Painted On, Runs Into Joint, Alloys and Makes Tight Weld

BY E. E. THUM

NEW automatic method of making gas-tight strong joints in fitted assemblies of smaller steel parts has been developed by the resourceful General Electric organization. In its present form, this method represents the development of several years and the combination of many operations and principles known previously and applied in other ways. To Christian Steenstrup, engineer Mechanical Research Department, is undoubtedly due the credit for visualizing the commercial possibilities, and building equipment large enough to treat composite pieces several feet in diameter.

Steel Joined with Copper

The process may perhaps be most easily understood by making certain comparisons with brazing. As is well known, the latter consists of welding with brass or bronze; fluxed surfaces are joined with a thin layer of alloy. Brazing can be done in several ways—either by dipping the assembly into a pot of molten metal, by sprinkling granular metal ("spelter") in the joint and heating it locally, or by the regular method of oxy-acetylene welding, using brass or bronze welding rod and suitable flux. But in any of these modifications the principle is the same; namely, if the steel or iron is clean and hot, melted brass will run over it in a very thin film, "wetting" the metal and forming a strong alloy with the surfaces in contact.

Pure copper, as a "brazing" material, was known to have extraordinary power to penetrate between finished steel surfaces fitted together. For instance, Dr. W. E. Ruder, when studying coarse-grained silicon steel in the General Electric Co. research laboratory several years ago, plated a specimen by dipping it in

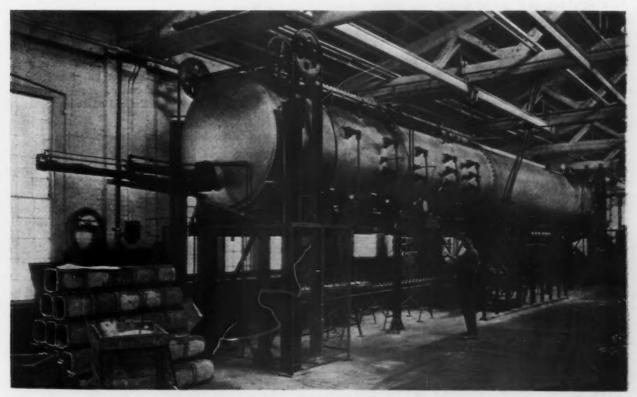


Fig. 1—Continuous Furnace for Coppering Joints Automatically in Evaporator Units. Pile of units ready for treatment shown at left

molten copper, and later found that the copper had penetrated far into the specimen between the metallic crystals, apparently separated from each other by microscopic distances. But hot copper at the melting temperature (unprotected by zinc or tin in alloy) absorbs oxygen from the air very rapidly, with general deterioration. Consequently "brazing" with pure copper would have to be done in an atmosphere containing no oxygen. Very well, fill the furnace with hydrogen, which will not only exclude the air, but will also react with any oxygen in the rust or mill scale on the steel, thus brightening the surfaces and performing the essential function of a flux.

Hydrogen Atmosphere Cleans Steel and Protects Copper

A ready commercial development of this main idea —of "brazing" with copper in an atmosphere of hydrogen—was due to the fact that the General Electric Co. had been annealing quantities of transformer sheets and magnetic irons in hydrogen for some time. Consequently such problems as the production of hydrogen, the prevention of hydrogen fires (hydrogen being a good fuel), the making of tight furnace casings (hot hydrogen leaks through solid steel rapidly), and the proper method of heat production and control had already been solved. How they were adapted to this "coppering" process is well illustrated by a detailed description of a continuous furnace (Fig. 1) designed by the industrial heating and welding engineering department.

The furnace casing is a welded steel shell about 6 ft. in diameter by 60 ft. long, closed at each end with a dished head, the near third being the heating chamber and the remainder a cooling chamber. Work is introduced through a bottom door close to the left end, and removed by similar equipment at the far end.

Fig. 2 gives a view of the charging elevators. The carload of work (two evaporator units made of sheet metal) is about to enter the open door in the very bottom of the furnace shell. When the I-beam cross frame is raised to the limit, the sand seal around the edges of the rectangular door closes against the furnace opening, the rollers on which the car rests are in line with the spool conveyor inside, and the evaporator units are at about the center of the circular casing. At 6 min. intervals the hydraulic ram shown at the end of the furnace pushes all the work in the furnace ahead one car-length, a carload of completed work is then lowered at the far end, rolled away and the empty elevator is raised, the now empty charging platform is lowered, a loaded car is rolled on and re-elevated. These successive operations are interlocked, and one workman attends to the entire routine. Full cars traverse the furnace end to end inside; empty car bodies return on a parallel conveyor near the floor.

Some gas escapes from the furnace when the doors are open. The pressure inside is kept just a little higher than the atmosphere, so a lazy flame plays across the open door, which, being flat, horizontal and pointing downward, gives little opportunity for the light hydrogen to escape. Only one door can be opened at a time, and oxygen which may enter the furnace by this or any other means is promptly burned by the great excess of hot hydrogen existing there, the chemical reaction forming steam. Since the hydrogen in the heating chamber is always far hotter than the kindling temperature, such oxygen is consumed as it may accidentally enter, without any opportunity to build up explosive mixtures.

The combustion hazard due to hydrogen can be mitigated by the introduction of nitrogen. Mixtures as dilute as 15 per cent hydrogen and 85 per cent nitrogen have been found satisfactory for several processes. In utilizing this mixture additional limitations are imposed as to cleanliness of work and absence of water vapor.

In the heated end of the furnace the interior is almost full of insulating materials, except for a rectangular passage down the axis large enough to pass the cars and the work. On the sides of this passage are arranged standard General Electric heating units: ribbons of nickel-chromium looped back and forth around refractory posts. These elements are connected in six circuits to three-phase, 220-volt power; three circuits are arranged in the forward or preheating portion, three more at the hottest region. Each circuit is independently controlled by its own pyrometer, Brown Instrument Co. temperature indicator and regulator, and G. E. contactor bank. This regulating mechanism is mounted on the switchboard shown at the center of the furnace. An operating temperature of 1125 deg. C. is required, since copper, which melts at 1083 deg., must be rendered quite fluid. This would be a rather high temperature for resistor elements in ordinary furnace atmospheres, but the hydrogen atmosphere prevents corrosion entirely. In fact, iron resistor ribbons have been used, but the resistance change with temperature for iron is so great that external resisance or special current control is necessary when starting the furnace cold. A series of manholes on top of the furnace gives access to the narrow heating chamber for such repairs as may be necessary. The view also shows the heavy copper cables for electric energy entering through proper bushings; the slender pipes set midway are pyrometer protection tubes.

The cooling end of the furnace is separated from the hot zone, not by a door but merely by a constriction of the heating passage to the minimum required for clearing the passing work. On passing this bottle neck, the hot metal finds itself traveling down the axis of a large open tank with water-jacketed walls. Time of passage is such that the work has cooled to about 100 deg. C. when it reaches the discharge elevator, and emerges cool enough so the clean copper or bare steel will remain bright. For other applications a certain amount of coloration may be permissible; in such instance the work may be removed a little hotter. If a bright finish is necessary, both the hydrogen and the nitrogen passing slowly through the furnace should be substantially free from oxygen, else the steam formed from combustion will react with the hot metal emerging into the cooling chamber and produce a blued steel surface.

It will be apparent that the furnace described is merely a device for automatically heating and cooling a continuous stream of metal parts in a special atmosphere. Obviously the copper for the welding or "coppering" of the various joints must be placed on the parts before they enter the furnace. How this is done may best be described with the aid of some representative sketches.

Copper Wired or Painted on Joints

Suppose a steel plug must be made of the lightest weight possible. The shaft is too deep for easy cupping, so it is formed of tubing as sketched in Fig. 3. Such a plug requires three pieces: (1) a head, cut from square bar, drilled, and with a round trough cut in one side; (2) a piece of tubing of correct length with internal shoulder at one end; (3) a round disk. The parts are machined to a snug fit; before the disk is placed and crimped down a little shot copper is put inside the tube. A copper wire (about 24 gage) is twisted around the shank close to the head. Such an assembly would be coppered standing on its small end, to make sure that the loose copper shot inside is fairly near the desired joint. During the process the hot hydrogen easily penetrates into the interior, either through the joints or through the metal, and properly deoxidizes all surfaces, so when the copper melts, capillarity will draw it into the joints and up the side of the steel, leaving a suitable fillet at all corners. The condition is sketched in the enlarged view. Excess steel may later be removed from the crimped end, the plug threaded, or any other operation given to it just as though it were a single piece.

When it is inconvenient to place copper wire or shot near the required joint, or when it is desired to copper coat an entire surface, a thick paint made of copper edges, and the central portion subdivided by similar bars alternately protruding from opposite sides. This constructs a labyrinth through which the steam must pass. Such an assembly, riveted together on the edges and properly coppered, will be found to possess tight metal-to-metal joints, completely welded, even though

Fig. 5 (Below Fig. 5 (Below at Center) at Center) tor Raising -Micrograph Carload of Two of Coppered Units into Fur-Joint in Mild nace. Second Steel Magnicarload awaits fied 100 Diameters. In disturn on spool conveyor tinction to autogenous welding, coppering causes no pronounced change in microstructure at joint Tube Shot Crimp. minimum it is Fig. 3 — Copper Placed Near Required Joints Either by Fine -Simple Stampings Screw Machine Parts Assembled into Intricate Unit and All Seams Either by Fine Wire Twist or Copper Shot In-Made Simultaneously by Coppering. Powdered copper painted on tical or overhead surfaces

dust suspended in quick-drying pyroxylin may be spread on the article. An instance of this practice, as well as an indication of the complexity of assembly which may be made from simple units automatically and simultaneously, is shown in Fig. 4. All these parts would be gaged to snug fits, and merely pushed together, with the exception of joint C, where an outstanding flange would be rolled over. A copper shot would be placed inside to make joint D, a copper wire would be wound around for A, and perhaps B. All the others, including C, would be painted, which is the simplest and easiest way to get a little copper on a vertical or overhanging surface.

As an instance of the distance that copper will penetrate into such joints, a so-called steam plate may be described. This consists of two pieces of boiler plate with a frame sometimes of 4-in. bars around the the copper must penetrate into contact surfaces 4 in. deep.

Smaller Furnaces for Intermittent Working

While the furnace illustrated in Fig. 1 is a very large one, suitable for mass production of a single piece (14 outlets are coppered simultaneously into each small condenser unit), other types of furnace for intermittent operation are constructed. The simplest is an electric muffle set on stilts, the bottom of which may be lowered away. A complete cycle of operations in furnaces of this type is as follows:

Lower the bottom, load the work, raise the bottom, displace oxygen inside the furnace with hydrogennitrogen mixture, raise temperature gradually to coppering heat, shut off heating current, allow furnace to cool, lower bottom, remove completed work. Such a cycle requires many hours, mostly to cool the furnace, for a furnace efficiently insulated for the heating operation is also insulated against the loss of heat for cooling.

To avoid this delay a three-stage furnace has been devised. It consists of a turntable, carrying three furnace bottoms symmetrically placed 120 deg. from each other. One bottom is open to the air for loading and unloading. The next is covered with a bottomless heating muffle. The third is covered with a similar shell, water-cooled. When ready to change loads, the two muffles with their hydrogen-nitrogen atmospheres are slowly raised, the turntable is indexed around 120 degrees, then the muffles are slowly lowered. In this way a fresh load goes to the heating chamber, a hot batch is transferred to the cooling chamber, and a cooled batch is ready for unloading.

Cost Data

Costs of the operation naturally vary with the size and number of pieces to be "coppered." The continuous furnace shown in Fig. 1 operates 24 hr. daily on evaporator units for automatic refrigerators. As noted, each unit has 14 outlets or nipples coppered tightly in the shell at one operation. Each furnace turns out about 500 units daily.

Expense for heat-resisting alloys in ribbons, car bodies and conveyor parts is almost zero, because, as already explained, the hydrogen atmosphere prevents scaling even at full red heat.

Metallurgical Considerations

A cross-section of a coppered joint in steel, as viewed under a microscope, is shown in Fig. 5. The copper has penetrated and alloyed with the surface in exceedingly thin layer; nevertheless this alloyed film is so strong that, when tested to destruction, the fracture will frequently pull the individual iron crystals out of the steel rather than split apart at the junction of copper to iron. As is true of glued, soldered or brazed joints, the closer the original pieces are placed

together and the thinner the filling material, the stronger is the resulting coppered union.

Hydrogen at the high temperature of operation has a pronounced decarbonizing tendency; consequently, surface layers of coppered articles will be lower in carbon and softer than at the start. Decarbonizing can be almost entirely prevented by electroplating the surface with copper. The time at high temperature is also sufficient to give a dead soft anneal. This effectually removes any possibility of "season cracking" or failure from internal stresses in parts which have been deep drawn or cold worked nearly to their limit. Socalled "hydrogen embrittling," caused by pickling steels in sulphuric acid, is a low-temperature effect of atomic hydrogen existing in what chemists call "nascent" condition; high-temperature heating in hydrogen gas, where the gas is in stable molecules, does not produce a similar effect.

Lastly, the time at high temperature is sufficient to cause considerable grain growth, especially in the higher-carbon steels hardened by cold work. This can be corrected by subsequent reheating to just above the transformation temperature, and desired hardness can be restored by a quick quench.

With these characteristics in mind, however, it is comparatively simple to select mild steels and design most parts so they will be safe when the metal is in the dead soft, most ductile condition. Properties of such steels are little affected by the moderate grain growth that will occur during coppering.

Not all steels respond equally. For instance, it has been found that hot copper will not "wet" and alloy with the surface of cold-drawn bars. During the drawing operation enough of the white lead lubricant used on the dies is caught and squeezed into the steel surface to prevent the copper from alloying with the steel. Furthermore, high-chromium irons and stainless steels do not readily respond—the chromium oxide on the alloy appears to prevent close union with the copper. In general, metals whose oxides do not reduce in hydrogen require an oxide-solvent flux to be used with the hydrogen.

BUSINESS UPS AND DOWNS

Credit, Building and Volume of Manufacture Forecast the Swings

SEVEN major swings in business have occurred in this country since the war, and each has been preceded by a similar movement in credit, in building contracts and in the volume of manufacture, according to Alvan T. Simonds, president Simonds Saw & Steel Co., Fitchburg, Mass., who writes in the May 1 issue of Looking Ahead. The major movements are listed as follows:

- 1. Upswing of 1919 and 1920.
- 2. Downswing through 1921.
- Upswing to spring of 1923.
 Downswing to fall of 1924.
- 5. Upswing to spring of 1926
- 6. Downswing to fall of 1927.7. Upswing since fall of 1927.

Indications are, the author says, that the present upswing will continue to a next high point in the spring of 1929, although there may be a considerable falling off in the summer of 1928.

Mr. Simond's article is illustrated by graphs showing trend lines for credit, building contracts and volume of manufacture for several of the periods mentioned. For credit he used the reverse of commercial paper rates in New York, as reported in the Federal Reserve Bulletin. The trend lines for building were based on contracts awarded in dollars, as reported by the F. W. Dodge Corporation, New York. The volume of manufacture was ascertained from data published by the Harvard Economic Service, Cambridge, Mass.

In each case, the trend lines are made by connecting low and high points of major movements and neglecting minor ups and downs.

Speaking of the general tendency to regard credit a negligible factor in forecasting business, Mr. Simonds says that one cannot get away from the fact that, since the war, business (from 12 to 18 months later) has followed the movement of money rates reversed, that the lowering cost of credit has stimulated building and manufacture and thus increased general business, and that increasing cost of credit has had the opposite effect. Many reason, he asserts, that decreasing business with less demand for credit brings lower money rates, and increasing business with greater demand for credit brings higher money rates; i.e., that changes in business cause changes in credit rather than the reverse. One is reminded of the question whether the hen or the egg came first. So long as the sequence holds good, however, it is well to be guided by it in business, Mr. Simonds holds.

A simplified practice recommendation for coated abrasive paper and cloth was adopted at a general conference at the Department of Commerce recently. The recommendation adopted corresponds to the original agenda and also conforms to the specifications of the Federal Specifications Board.

The Wisconsin Steel Co., South Chicago, placed in operation in April two new 100-ton open-hearth furnaces. This company now has seven 100-ton furnaces operating.

Investments Abroad Promote Exports

Favorable Balance of Trade Sustained by External Loans and Purchases of Foreign Securities—Larger Exports Call for Greater Imports

BY EUGENE P. THOMAS*

NE of the most outstanding evidences of the recovery of Europe is the stabilization-either already accomplished or likely to be accomplished in the near future-of the currencies of the principal European nations. While the effect on our foreign commerce of this stabilization of the currencies of nations, which in the aggregate are our best customers, has undoubtedly been beneficial, there are other factors to be considered. One, of prime importance, is the payment of reparations and of international debts incurred for the prosecution of the war and for reconstruction purposes. It is obvious that, in the last analysis, these payments can only be made in the form of European exports of merchandise, and by services rendered, such as, for instance, ocean freight and insurance charges. To the extent that such credits are applied to the payment of reparations or international debts, they cease to be available for payment for American exports.

If, therefore, our exports are to be increased, or even maintained at their present volume, the credits available for payment for them must also be increased, either by increasing the volume of our imports of merchandise or by constantly increasing our purchases of foreign securities and extending additional credits. While this, under certain conditions, may be perfectly safe, and good business, it is plain that it has its limits.

Imports, Including "Invisible" Items, Exceed Exports

In arriving at a correct understanding of what is our real balance of trade, it is necessary to take into consideration what are termed by economists "invisible exports" and "invisible imports." Among the "invisible exports," which serve to pay for imports into this country, are the dividends and interest accruing on American investments abroad, re-payments of loans and credits extended to foreign debtors and buyers of our products, purchases by foreigners of American securities, and deposits by foreign bankers and other foreigners in American banks. On the other side of the account, the "invisible imports," which serve to pay for American exports, include the dividends, interest and repayments accruing to foreign investors in American securities and foreign depositors in our banks, expenditures abroad of American tourists and residents, and the remittances of immigrants from this country to Europe.

After taking into consideration all of these various invisible items on both sides of the account, it is estimated that our total net import balance (i.e., the excess of imports over exports, both visible and invisible) during 1926, was \$1,025,000,000, which is accounted for by sales in the United States of foreign securities, which, it is estimated, amounted during the same year, to a total of \$1,332,000,000.

During the nine years, 1919 to 1927, the value ofour total exports of domestic products was slightly under 47 billions of dollars, and of our imports of merchandise, during the same period, slightly over 35 billions of dollars, a difference of approximately 12 billions of dollars which was undoubtedly offset by new American investments in foreign securities during the same period of nine years, to an approximately equal amount, without which it would have been impossible for the foreign purchasers of our products to have paid us for this excess of exports over imports of merchandise.

It is estimated that the total of our foreign investments now amounts approximately to 15 billions of dollars. For the purpose of comparison, it is estimated that Great Britain's foreign investments now amount to at least 20 billions of dollars, on which there is annually accruing a large revenue. During a period of more than 50 years preceding the outbreak of the World War, Great Britain had constantly what economists call an "adverse balance," that is to say, her imports of merchandise heavily exceeded her exports, but nevertheless her wealth and prosperity continued to expand. During all of this period Great Britain's foreign investments steadily enlarged and were an important factor in increasing her exports of merchandise, but nevertheless the so-called "adverse balance" continued, for the reason that it represented the balance, over and above what was reinvested, of the profits derived from the foreign investments.

The experience of Great Britain unquestionably proves that the normal condition of the foreign trade of a creditor nation, such as ours, is what the economists call an "adverse balance"—i.e., so far as excess of imports over exports is concerned—and that any other condition is abnormal and cannot exist permanently.

As our manufacturing industries continue to develop, foreign markets for constantly increasing quantities of our products will be necessary, and we must accept payment for our exports in the only form which is possible to the foreign nations to which we sell, or , continue to balance the differences by liberal loans and generous remittances to Europe for expenditures there. If there is a constant increase of our foreign investments and consequently of the dividends, interest and re-payments accruing from them, our imports of merchandise must continue to increase, not only to the extent necessary to cover the so-called "favorable balance" of merchandise shipments, but also, to enable the transfer to this country of the dividends, interest and other payments accruing on our foreign investments in excess of our new exports of capital. There are, in actual practice, only two alternatives, i.e., increased imports or decreased exports. Last year, notwithstanding that our exports of domestic products increased over 1926 by \$46,593,000, our imports decreased. as compared with 1926, by \$246,510,000.

The demand of Europe for our meat and raw cotton accounts for an excess of merchandise exports to that continent, by a billion dollars annually. This is practically offset by our net merchandise indebtedness to Asia and South America, leaving as a net balance our excess of manufactured exports to North America and Oceania, amounting to some 400 million dollars per year. As pointed out, this gain is offset by the fact that our foreign investments are now running at the rate of more than a billion dollars a year and are in excess of this so-called "favorable balance of trade," but as our prosperity increases, our demand for foreign

*President United States Steel Products Co., New York. Abstract of address delivered before National Foreign Trade Council at Houston, Tex., April 25.

(Concluded on page 1334)

Stoves Molded and Poured

BY F. L. PRENTISS*

A DOPTING modern mechanical handling and mass production methods that are very similar to those followed in automobile manufacturing plants, the Peninsular Stove Co., Detroit, recently placed in operation a new plant, including a continuous foundry, manufacturing departments and assembling lines, that represents a marked step forward in the stove making industry. The Peninsular works is an outstanding example of the modern type of factory construction and efficient plant arrangement.

Straight-Line Flow Is a Feature

One feature of this interesting plant is that all the manufacturing departments are so arranged in one complete manufacturing unit as to provide for a steady and largely a straight-line flow, in the proper volume, of work in process, including the castings produced in the continuous foundry and the finished stamped and enameled parts that finally meet on the assembly lines. Thus the foundry operates on a production schedule that synchronizes with the production in the stamping and other departments in which the sheet metal parts for the stoves are made and finished.

All the departments are located in connecting rooms of one single-story manufacturing building 356×910 ft. The plant is served by two railroad sidings. One

along the back, or east, side delivers pig iron and other material to the cupola stock yard. The second track, along the north side, delivers sheet steel to the stamping department, which adjoins the foundry and extends into a covered shipping room near the front, at the side of the finished stock room. At the front end of the building, adjoining the shipping department, is a covered loading platform for trucks.

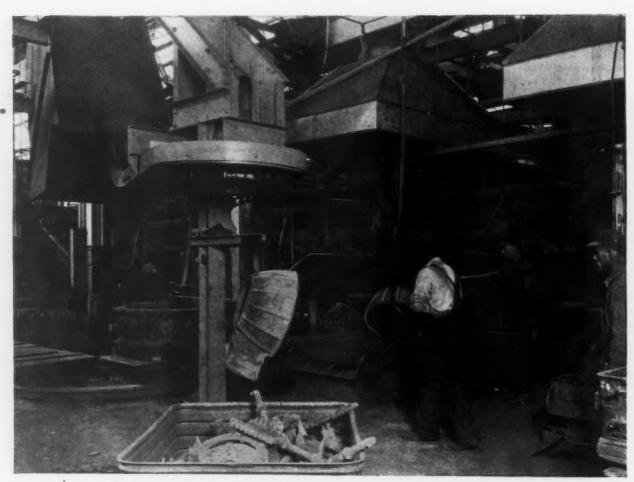
Starting from the cupolas at the east end, the molten iron is carried down a center aisle to the pouring stations. The castings move on in a straight line to the cleaning department and, from there, to the stove assembly department, where the streams of castings and stampings meet at the assembly lines. Completed stoves are crated on these lines and pass along into the adjoining finished product storage room.

First Stove Foundry Arranged for Continuous Operations

The foundry is of particular interest because it is said to be the first stove foundry arranged for continuous pouring and molding. In addition to stoves, house heating furnaces are made, the castings being similarly routed in a straight line and the furnaces finally assembled on a conveyor.

The foundry is well provided with conveyors, hoists and other handling equipment, handling, wherever pos-

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MOLDS for Furnace Castings Are Pushed Off the Mold Conveyor by an Air-Operated Pusher. Castings, after shaking out, are handled by an electrically controlled porter bar. Casting conveyor in the foreground carries them up over the roof and down to the sand blast

Continuously

Straight Line Flow of Materials, Mold Conveyors, Sand Handling and Synchronizing Output of Castings with That of Stampings

sible, being done mechanically. Consequently the amount of man power is cut down and hard foundry labor is reduced to a minimum. The capacity of the foundry is 80 tons of castings per day, and the daily capacity of the plant is 300 gas stoves and 120 furnaces.

Four Continuous Molding Units

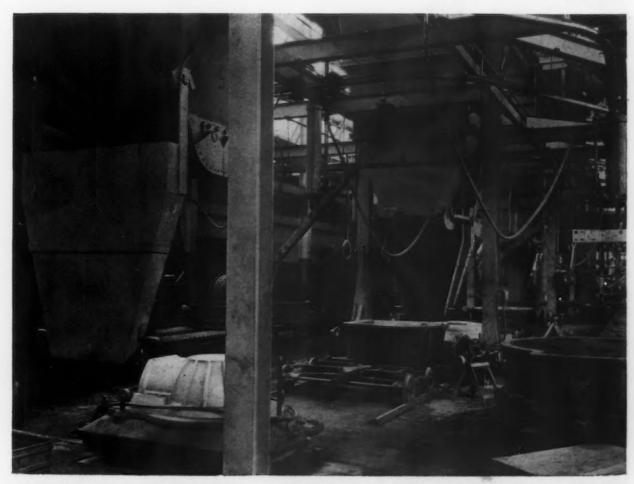
The foundry has four continuous molding units, each for a different class of work. Three of these, located in a line at one side of a center aisle, are provided with mold conveyors. Two are used entirely, and the third to a large extent, for making furnace castings. One molding unit, known as the fire pot unit, is used for making fire pots and grates. In the center unit, designated as the main furnace unit, radiator, ash pit and feed section castings are made. The third unit is used for smaller miscellaneous work, including fronts and doors for furnaces and burners and a few other parts for gas stoves. On the opposite side of the foundry, across the center aisle, in a space 24 x 240 ft., stove plate castings and other stove parts are made. The molds for these are hand made.

The three mold conveyors are rectangular in form. The main unit is 150 ft. long, and its platform consists of 28 plates, 36 in. wide on 63-in. centers. The fire pot unit is 156 ft. long and has 34 platforms, 30 in.

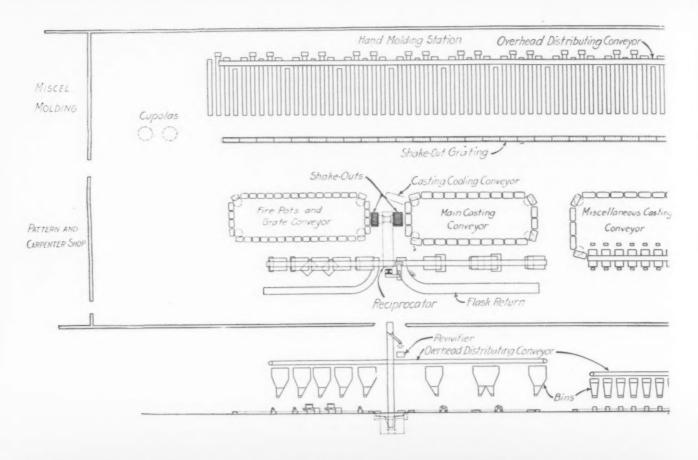
wide on 54-in. centers. The mold conveyor in the small miscellaneous casting unit is 231 ft. long and has 38 platforms, 33 in. wide on 72-in. centers.

Molds made in the main and fire pot units are transferred to the mold conveyors with air hoists suspended from monorails and are poured on the conveyors. At the end of each conveyor is a jolt-type shakeout, these being located side by side a few feet apart, each serving one unit. The shakeouts have 4 x 5-ft. grating tables, and each is operated by two jolt cylinders, one at each end of the table. The mold is pushed from the conveyor to the shakeout by means of a horizontal, air-operated mold pusher, the bottom plate, which is on a level with the shakeout grate, remaining on the conveyor. After the shaking out, air hoists place the empty flasks, as well as the bottom plates, on gravity roller conveyors, which carry them back to the molding machines. The castings are lifted from the shakeout by means of a porter bar having an electrically controlled lift, so that the work of the operator is confined to steering the castings to a cooling

This conveyor is 645 ft. long and consists of an endless chain connecting small trolleys running on a monorail, the trolleys being provided with hooks on which the castings are suspended. The conveyor, starting at the loading end adjoining the shakeout grate, runs up

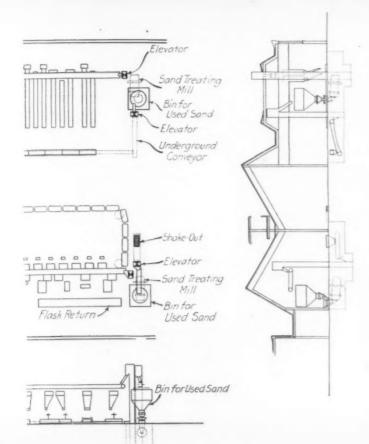


M AIN Molding Unit Equipped With Four Molding Machines. Starting at the left is the cope and drag of the feed section and further down the line are the cope and drag of the radiator. Part of the mold conveyor is shown at the right and the return flask conveyor at the left





STOVE Plate Foundry Floor Equipped for Continuous Operation. Molds are made on molding frames from which they are pushed on to gravity conveyors. They are poured at the end of these conveyors. Then they are pushed on to the movable conveyor section on the track from which they are dumped over the shakeout. Empty flasks are returned on gravity conveyors at the side of the molding conveyors



STRAIGHT Line Flow in the Handling of Materials and Castings in the Unique Foundry of the Peninsula Stove Co. Is Clearly Shown by This Plan Drawing

BELOW Is Illustrated Three Types of the Conveying Equipment at One Point in the Foundry. Castings come down from the left on the cooling conveyor (in the curved form), a chain suspended from the adjoining trolley is attached and the forward movement of the cooling conveyor causes the castings to be pulled off the hooks of this conveyor. This is shown at the left. The castings are then pushed on the monorail around to the loading end of the sand blast room shown at the right. Coming out of the discharge end of that room, at the right, they are deposited on the furnace conveyor shown in the lower part of the picture





CUPOLA Charges Are Made Up in Buckets on a Scale Car in a Pit in the Stock Yard and Are Raised to the Cupola Charging Floor by an Electric Crane and Dumped into Either of the Two Cupolas. Only one man is required on the charging floor

a sharp incline to a point above the roof and then down to a sand blast in the furnace assembly department. It takes 105 min. for the casting conveyor to make its circuit.

Mold Conveyors at Variable Speeds

The large molds are made in cast iron flasks, their size being much larger than those usually handled on mold conveyors. The largest flask, that for radiator molds, is approximately 6 ft. in diameter and 20 in. deep. The castings made in this mold weigh about 200 lb. The mold conveyors are operated at variable speed, the speed being regulated to handle molds at the rate required under the production schedule at which the plant is being operated.

No drag molds are used in making feed section, radiator and ash pit molds, these molds being made with a cope and bottom plate. The drag is in effect a green sand core raised above the bottom plate to form an artificial parting. When the mold is pushed off the bottom plate the drag is left on the mold conveyor. Drag molds for radiators and feed sections are made on jolt roll-over pattern-drawing machines, and the copes on jolt stripping machines. Fire pots are made on jolt roll-over pattern-drawing and jolt-squeeze stripping machines.

The third molding unit, used for small miscellaneous castings, has a jolt shakeout at the west end of the molding conveyor, adjoining tumbling mills. The molds are made in snap flasks on two lines of jolt-squeeze machines, one row on each side of the conveyor. The molds are placed on the conveyor by hand.

A Continuous Hand Molding Arrangement

One of the problems that came up in laying out and equipping the foundry was to provide suitable equipment to permit continuous operation of the hand mold-

ing department, in which stove parts are made. The bottom board is set on the platform of a specially designed cast iron molding frame on which the mold is made and rammed by hand. The flask is of the usual hinge type used in stove work. When the mold is completed, trunnions are clamped on the flask, which is then turned over with an air hoist. Then, by the operation of a foot treadle, two rollers in the molding frame are raised up, coming in contact with the bottom board and at the same time raising the flask slightly, bringing the bottom board in a horizontal line with an adjoining gravity roller conveyor. The flask is then pushed off the two rollers on to the gravity conveyor without jarring the mold. There are 40 molding stations, each having a gravity mold conveyor. At the side of these conveyors are empty flask gravity conveyors inclined in the opposite direction, one empty flask conveyor being provided for two molders, so that every third gravity conveyor in the line is a return flask conveyor.

The completed molds move down the gravity conveyor to a section of a roller conveyor that moves backward and forward on a 6-ft, wide transfer track extending down the foundry floor between the gravity mold conveyors and a shakeout. When several molds have accumulated at the end of the gravity conveyor, they are poured and pushed over the movable transfer conveyor and dumped on the shakeout grate, which is 30 in. wide and extends the length of the floor molding unit, a distance of 240 ft. Flask and bottom boards are placed on the return conveyor and go back to the molding stations. The castings are loaded in steel boxes mounted on skids, and an electric lift-platform truck takes them to tumbling mills at the end of the molding floor.

Castings are tumbled in eight mills, arranged in two batteries of four each. Five of the units are square mills, four 36 in. square and 56 in. long and one 48 in. square and 60 in. long. The large mills are used for both heavy furnace and stove work, the smaller stove castings being packed in with the larger work. Each mill is provided with a clutch so that it may be operated independently of the others in the unit. The mills were made by the Royersford Foundry & Machine Co., Royersford, Pa. They have "Texrope" drive.

Clam Shell Bucket Handles Coke with Minimum of Crushing

Efficient methods with some new features are provided for handling raw materials to the cupolas. Pig iron and scrap are unloaded from cars with a magnet attached to a 5-ton Shepard crane with a 60-ft. span that serves the raw material storage yard. Coke delivered in hopper bottom cars is dumped into a bin of one carload capacity under the car track in the storage yard. When making up a cupola charge, a specially designed clam shell bucket holding ¼ ton, handled by the yard crane, is let down under a gate at the side of the bin, is filled automatically and is automatically closed when the bucket is lifted. With this handling system, crushing the coke is largely avoided. Sand is stored in one section of the yard in concrete bins having a 20-ton carload capacity.

Charges of iron, coke and limestone are made up on a bucket set on an electrically operated scale car located in a pit about 8 ft. deep, which extends out from beneath the cupola charging floor across the raw material storage yard. The crane delivers the material into the bucket, the top of which stands at about ground level, and the charge is weighed on dial-type scales. The car then moves to the other end of the pit, spotting the bucket beneath a well. Through this opening the bucket is raised to the charging floor by the hoist of a 2-ton Shepard crane.

Iron is melted in two cupolas operating on alternate

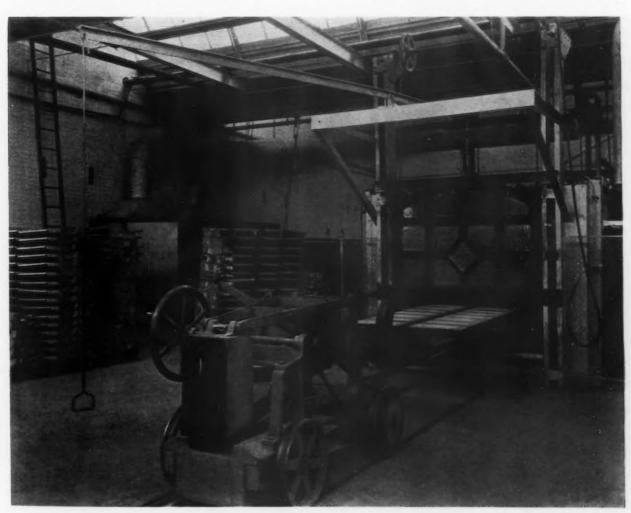
days. The crane, after hoisting the load, delivers the bucket into either cupola through 12-ft. openings, and the charge is dumped from the bottom of the bucket. The bucket is so constructed that, when the empty bucket is drawn from the cupola and set on the floor, the bottom automatically closes. Only one man, the crane operator, is required on the charging floor. The cupolas are 72 in. in diameter, lined down to 52 in. They were built by the Northern Engineering Works, Detroit.

The cupola is tapped with a 1-ton ladle suspended from a monorail crane, hand propelled but having an electric hoist. The molds on the three power conveyor lines are poured directly from the ladle. Iron for the hand floor is conveyed in the ladle to points along the foundry floor where it is poured into hand ladles.

Sand Tempered as It Leaves Shakeout

Three independent sand-handling systems are provided, one for the two large main and fire pot molding units, one for the small miscellaneous unit and a third for the stove plate unit. The sand-preparation plant for the main and fire pot units is located between the two sets of hoppers that serve those units. Sand from the shakeout grates passes to an underground reciprocating conveyor, then up an elevator to an aerator built by the Jeffrey Mfg. Co., Columbus, Ohio. From this the good sand drops on an overhead distributing conveyor, which extends in both directions over the sand hoppers above the molding units. This conveyor is reversible and acts automatically in filling the hoppers. There are eight sand hoppers, four for each unit, seven of 20-ton capacity and the other of 30-ton capacity. Each bin is equipped with one or two clam shell gates and serves one or two molding machines.

A feature of the sand-handling system of these two units is an arrangement for adding water to the sand



ELECTRICALLY Heated Oven for Baking Stampings and Special Machine for Loading the Oven. A similar machine on the opposite side takes out the work after baking

as it leaves the shakeout grates, giving the advantage of early tempering of the sand with water before it starts on through the sand-preparation system. The supply of water sprayed on the sand is automatically controlled by the valve that operates the shakeout, so that the amount supplied always depends on the speed at which the molds go to the shakeout.

Sand for the miscellaneous unit is taken from the shakeout through an elevator to a large storage bin. Used sand from this bin and new sand from a smaller bin flow simultaneously and in any desired proportions into a continuous type of sand-treating mill. This mill discharges into an elevator, which delivers the sand to a distributing conveyor that discharges it into 12 bins, each of 6-ton capacity, over the molding machines. Each bin has two clam shell gates and serves two molding machines.

Sand from the shakeout grate of the stove plate unit passes to a belt conveyor, 24 in. wide and 260 ft. long, at the end of which is a magnetic separator pulley. From this the sand makes a right angle turn over a short belt section that delivers it to an elevator from which it is discharged into a sand-treating system similar to that used for the miscellaneous casting unit. A second elevator discharges the sand on to an overhead distributing conveyor, 260 ft. long, which carries it to 40 bins, each of 2-ton capacity, located over the molding positions, the sand being distributed to the bins by plows. Each bin has a clam shell discharge gate control through a hand lever and a swinging spout designed to hold its adjustment in any position.

Mention was made previously of the delivery of furnace castings from the shakeout grates to a casting cooling conveyor. This conveyor, after passing over the roof, extends down to the cleaning department, running alongside a hand-operated trolley that serves a sand blast room. A chain hooked to the trolley on 30-in. centers is hung around the casting, and the movement of the cooling conveyor causes the release of the casting. It is then pushed on the trolley, from which it is now suspended, through the sand blast room. This is a double-chamber unit, one man working on each side of the casting. The sand blast unit was supplied by the New Haven Sand Blast Co., New Haven, Conn.

Castings leaving the sand blast are placed on an assembling table by an air hoist. This table is a flat, continuous moving platform, 30 in. wide and about 125 ft. long. Fins are ground off by a disk grinding wheel located close to the table. Air hoists are provided for lifting the castings off the table for other operations. Practically all the fitting and assembling of the furnace is done on the conveyor.

Special Loading Machine for Enameling Oven

All the presses in the steel stamping department are motor driven. Along the length of one wall are die racks, all numbered. These are wide at the bottom tiers for the larger dies and taper in width toward the top. Stampings to be enameled go to the pickling room and then to the enameling room. Spray enameling booths are located along the sides of this room. Three coats, a slush coat and two white coats of enamel, are applied, each coat being burned on after its application.

Two electric ovens, built by the George J. Hagan Co., Pittsburgh, equipped with Leeds & Northrup pyrometers and registers, are used for baking, one for steel and the other for cast iron. The castings, which are sand blasted before enameling, are kept in the oven 20 min. at a temperature of 1200 deg. Fahr. The steel stampings remain in the oven 2½ min. at a temperature of 1600 deg. The stampings, after enameling, are loaded on forks on the table of a specially designed loading machine and the table is lowered slightly, depositing the work on stationary forks inside of the oven. A similar machine removes the work from the opposite side of the table. With this type of loading

equipment the loading forks are not kept in the oven and consequently do not become heated.

There are three assembly lines or mounting tracks, 160 ft. long, for stoves, two for gas units and one for electric stoves. Stove frames and some of the larger pieces are assembled on stands located at the side of the lines. The frames are then placed on the roller conveyors of the assembly lines, located at a convenient working distance above the floor, and on these they are pushed along as the various parts, such as manifolds, linings, heat controls and doors, are put on. When the stoves are assembled, connections are made with gas or electrical lines and they are tested. Then they are inspected, cleaned, wrapped and crated on the assembly line, from which they go to the warehouse.

The pattern shop adjoins the foundry at the east end, and on a mezzanine floor above this is a designing department and sand testing department. A 14-ft. bay on the north side of the foundry, adjoining the large molding units on the side and the pattern shop at one end, is provided for the storage of patterns and flasks along the line of the molding machines.

The building is of steel, brick and glass construction, designed for efficient lighting and ventilation and in other ways providing a comfortable place for men to work. Above the roof are three high and four low monitors. Less than one carload of lumber was used in building the plant. It has a tile slab roof covered with asphalt. In the foundry the flooring is cement except the gangways, for which paving brick was used. There are wood block floors in the assembly department and press shop. The interior walls are painted white except for a strip a few feet up from the foundry floor, which is gray. The entire plant is heated by a forced hot water heating system, water being heated in two 250-hp. boilers. To keep the foundry as free as possible from smoke and dust an exhaust system is provided, with hoods over the shakeout grate.

The plant was designed by Albert Kahn, Inc., Detroit, in collaboration with E. L. Dwyer, vice-president and general manager, and Lon Kimball, general superintendent of the Peninsular company, and with the Osborn Mfg. Co., Cleveland. The Osborn company laid out the entire foundry equipment and designed and built the sand-treating and handling equipment, mold conveyors, casting conveyors, furnace assembly conveyor and molding machines. Tramrail equipment and electric hoists for handling material and castings were supplied by the Cleveland Crane & Engineering Co.

Ten Years of Air Mail

Postmaster General New has done well in designating the week of May 14 as Air Mail Week. He and his department can look with pride on the record of the 10 years since the first regular service, operated with planes and pilots borrowed from the War Department, was started between New York and Washington on May 15, 1918. Between New York and San Francisco the first aim was not at a real air mail service, because no attempt was made to carry a letter on to its destination, but merely to advance it on its journey. Thus, between New York and San Francisco traveling by train at night and plane in daylight hours the old transcontinental mail-time record of 87 hr. was reduced to between 50 and 60 hr. The actual air mail service between the Pacific and Atlantic Coasts began in August, 1923. The best time recorded in the tests of that month with 15 intermediate stops was 26 hr. and 14 min. In July, 1925, came the beginning of an overnight service between New York and Chicago.

In all there are now 22 routes in operation covering a total mileage of 9916. Every day mail pilots fly a distance of 22,110 miles, carrying mail averaging nearly 5700 lb. Three other routes already under contract will add 1705 miles to the system, and four additional routes with a mileage of 2279 have been advertised, with the prospect of contract awards within the year.

Open-Hearth Men Discuss Problems

Furnace Construction and Operation and Methods of Controlling Steel Quality Are Features of Semi-Annual Meeting

REGISTRATION at the seventh semi-annual meeting of the open-hearth committee, functioning under the auspices of the American Institute of Mining and Metallurgical Engineers, was 81. The meeting was held in the Hotel Ohio, Youngstown, under the chairmanship of Leo F. Reinartz, the second meeting under his guidance. At the close of the third technical session Mr. Reinartz was unanimously reelected as chairman of the committee for the ensuing year. At the same time, C. H. Herty, Jr., United States Bureau of Mines, Pittsburgh, was elected secretary of the committee. Expression was given to the thought that in this capacity Doctor Herty would be able to give the committee more directly the benefits of his researches along the lines on which the committee is working.

In his remarks after calling the assemblage to order, Mr. Reinartz made a plea for promptness in getting into the committee's hands the open-hearth drawings and answers to the open-hearth questionnaire which was set out after the Detroit meeting last fall. Only seven or eight of the companies have responded, so far, in full to the request for data and the point was again emphasized that only those companies which supply such data will be furnished with the accumulation of data from all the sources from which received.

As in previous meetings of this group, great earnestness was displayed in all the topics discussed. This, as before, was carried outside the meeting room. Knots of men in the lobby and in the corridors were "talking shop." They were establishing new contacts, or cementing those already established at earlier meetings, and setting the stage for the inevitable inter-plant correspondence between meetings, which, in the opinion of some of those present, forms one of the most valuable features of the whole affair. Not a few baffling problems have been thus threshed out, with benefits all around.

No Set Papers Read at Meeting

Consideration of topics was taken up in accordance with the preliminary announcement set out before the meeting. The morning session of May 3 was devoted to construction of open-hearth furnaces. The afternoon meeting was devoted to furnace operation, both metallurgical and physical. The morning session of May 4 was concerned with the question of control of quality

of steel tapped from the furnace.

During the afternoon of May 4 about half of the men present visited the open-hearth departments of the Republic Iron & Steel Co., and of the Youngstown Sheet & Tube Co. At the Republic plant one of the main features of interest was a stationary furnace tapping 170 tons through a bifurcated spout. R. L. Leventry, superintendent of open-hearth and mills, explained that the two ladles receiving metal from this spout are so evenly divided as to metal contained that they come ordinarily within an ingot of each other. There is provision in the spout, however, for diverting the flow of steel more heavily toward one ladle or the other. This consists of a form of baffle made up of two short stopper rods which can be swung one way or the other. They are, of course, fitted with normal stopper sleeves and heads.

Construction of Open-Hearth Furnaces

IN considering the most desirable hearth area and depth of bath for a furnace tapping 125 gross tons of steel this question was asked: "Is it desirable to have a relatively oversized hearth to melt and refine a charge of very light, bushy scrap?"

Discussion was opened by E. L. Ramsey, superintendent of open-hearth and blooming mills Wisconsin Steel Co., South Chicago. He described his own furnaces as of 100-ton rating, but averaging in 1927 118 tons to the heat. These furnaces have a bath area at the slag line of 620 sq. ft., which figures out about 5½ ft. to the ton on the heats actually tapped. The depth of this bath on such a heat is 28 in., which was characterized by Mr. Ramsey as about half-way between a deep and a shallow bath. The speaker's preference is for a deep bath. He expressed the opinion that a deep bath is not so fast an operator, but that it usually gives a better quality of steel. It has less surface area to the ton of contents for oxidation by the flame. It cleans up lime better from the bottom.

For acid steel castings the Wisconsin plant has put in two furnaces which are fairly deep. A new furnace for a charge of 100,000 lb. for forging and casting steel has been installed, but it is found that the foundry is satisfied with from 50,000 to 60,000 lb., and consequently the resulting bath is shallow. This at first caused rejected castings to a large amount, sometimes making 75 per cent of scrap. Changes made in this furnace, increasing the depth from 13 in. to somewhat more than 18 in., cut down these rejections materially.

Unusual Tonnage from Deep-Bath Furnace

Further expression of desire for a small hearth, with resulting small slag line to repair, was made by R. L. Leventry, Republic Iron & Steel Co. His plant includes one 100-ton furnace which has been consistently overcharged to such extent that it averaged 136 tons to the heat at its last run. This run persisted through 402 heats, making a total of 54,700 tons of steel in the one campaign. It was under process of rebuilding at the time of the meeting.

This furnace, which uses coke oven gas as a fuel, has a hearth measuring 15 x 40 ft. inside the brick and about 14 x 39 ft. on the slag line. It was reported as giving better steel than the general run of furnaces in the shop, which are tapping about 82 tons on a rated capacity of 60 tons each. These furnaces measure 15 x 34½ ft. and are operated on producer gas. The depth of bath in the large furnace is estimated at 34 in. The charge includes a great deal of light automobile and other scrap. Part of the gain in quality, as compared with steel from the smaller furnaces, was attributed by the speaker to the fact that the coke oven gas was much lower in sulphur than the producer gas.

Furnaces at the Corrigan-McKinney plant have recently been increased in size from 90 to 115 tons. L. E. Yost, open-hearth superintendent at that plant, expressed the belief that the bath should have a depth of 30 in. or so for a 125-ton heat. He made a strong plea, however, for holding the surface of the bath below the sill plate. He characterized as dangerous the common practice of building up a dike of dolomite and permitting the bath to go several inches higher than the sill plate. For 115 tons these furnaces have a hearth area of 630 sq. ft., or 5½ sq. ft. to the ton.

Crane Capacity Sometimes a Governing Feature

Increase in the length of one new furnace, designed originally for 70 tons, was reported by James R. Stuart, open-hearth superintendent of the Colorado Fuel & Iron Co., Pueblo, Colo. This furnace, which originally had a bath measuring 15 x 36 ft., has been lengthened to give a 42 ft. slag line and is at present tapping 80 tons. This is far below its present capacity, however, and it is expected that the charge will be

raised so that from 100 to 120 tons may be tapped from the furnace as soon as the crane equipment of the plant is increased to take care of the heavier load. The crane capacity is now the neck of the bottle. The bath is 34 in. deep and the charge includes a large proportion of light scrap. Most of the furnaces in this plant are nominally of 50 tons, but are tapping regularly from 70 to 72 to 72

larly from 70 to 72 tons.

Limitation of crane capacity was given by J. H. McDonald, open-hearth superintendent Algoma Steel Corporation, Sault Ste. Marie, Canada, as holding his furnaces to 80 tons. His bath measures 14 x 42 in. inside the banks, giving 588 sq. ft. It is only 22 in. deep. The scrap charge is mostly light. He reported tapping 55 tons on a 35-ton furnace by getting the bath up to 13 in. above the sill plate. This gave a depth of 30 in. in the furnace. With this large charge a small furnace takes about the same length of time in making a heat as the 80-ton furnace. Producer gas is the fuel and about 10 per cent of limestone is charged.

Especially Large Furnaces at Weirton

Dimensions of three large furnaces at the plant of the Weirton Steel Co., Weirton, W. Va., were given by Frank A. King, open-hearth superintendent. One furnace, built originally for 100 tons and now tapping 150 , has a hearth measuring 16 x 40 ft., with an area of 630 sq. ft., or only 4.2 sq. ft. to the ton. The depth of bath is about 3 ft. This furnace takes 11 to 12 hr. to make a heat. A 200-ton furnace in this plant has a bath measuring 17 x 43 ft. The latest and largest furnace at Weirton is a 300-ton furnace, with a bath measuring 19 x 49 ft. and fully 4 ft. deep. The 200-ton furnace takes 15 or 16 hr. to make a heat, while the big one requires about an hour longer. The quality of steel obtained from these three sizes of large furnaces was reported about the same as from 100-ton furnaces, and they give no more bottom trouble than do the others.

Furnaces at the Lowellville plant of the Sharon Steel Hoop Co. were reported by J. M. Hughes, general superintendent, as having averaged 108 tons to the heat in 1927, against a rating of 91 tons. These furnaces have a bath 34 ft. long and measuring about 14 ft. 9 in. between brickwork and 13 ft. 7 in. on the slag line. This area works out at 501 sq. ft., or 4.65 sq. ft. to the ton. The bath is 2 ft. 9 in. deep. The scrap charge was characterized as "medium light," including a miscellaneous variety of scrap, much of

which is decidedly light.

Special Orders Placed With the Deeper Furnaces

At the Donner Steel Co., Buffalo, several furnaces built for 85 tons are tapping 100 tons. Samuel B. Muir, open-hearth superintendent, gave the hearth area as 500 sq. ft. and the depth of bath as 27 in. Two tilting furnaces at this plant, having the same capacity as the others, have hearths of 550 sq. ft. and only 24 in. deep. Mr. Muir explained that very few special heats are made on the tilting furnaces, because it is difficult to get the same grade of steel. There are more inclusions in the steel, although the furnaces are faster working. He attributed this to the fact that the bath was shallower than with the stationary furnaces. Shallow baths are bad, according to Clem B. Col-

lingwood, superintendent of open-hearth and rolling mill Stanley Works, Bridgeport, Conn. In his plant, which is the old American Tube & Stamping Co. unit, a 75 to 80-ton furnace has a bath measuring 11 x 30 ft., giving 330 sq. ft. of area. It is 30 in. deep. The bath contents are 725 cu. ft., which works out at an average bath depth of 26½ in. He referred to five furnaces measuring 12½ x 42½ ft. on the slag line and only 20 in. deep, in which the limestone was sticking up through the slag during a good portion of the operation. At tapping time these shallow furnaces frequently sent out slag ahead of the steel and the steel quality was expressed as "rotten."

Should All the Scrap Go In at One Time?

Furnaces 34 ft. long and 121/2 ft. wide on the slag line were reported by Robert L. Cain, open-hearth superintendent Bourne-Fuller Co., Cleveland. These are tapping 90 tons, the bath being 32 in. deep. The scrap is all light and it is found necessary to put it in on the instalment plan, varying from three to as many as six or seven batches. These are successively partly melted down before there is enough room to get in the next batch.

In the opinion of Kenneth C. McCutcheon, openhearth superintendent American Rolling Mill Co., Ashland, Ky., it is better to put all the scrap in at once rather than melt in batches, if it is possible to get it into the furnace at one time. Use of an oversize hearth for light scrap, said Mr. Ramsey, results in automatically falling back to a shallow bath. The problem might be met by using a high roof and large doors. This, however, would probably result in a larger fuel consumption. The furnace may be cooled off to a greater degree if all the scrap is charged at once, but when it is charged in instalments the subsequent lots have a tendency to solidify the bath already melted, and thus make it necessary to melt it all over again.

This question was touched on by G. D. Tranter, open-hearth superintendent American Rolling Mill Co., Middletown, Ohio, who explained that his practice is to put in light scrap in from two to five drags. This is with a cold metal charge. He expressed the opinion that there is no difference in the time of making the heat, from variation in the number of drags of scrap, but that there is a greater oxidation loss as the number of drags increases. To offset this it is his practice to charge one buggy of pig iron with the first charge of scrap and get the resultant working.

Larger Furnace Makes More Heats

Improvement in life of furnace was reported by W. F. Davis, open-hearth superintendent Youngstown Sheet & Tube Co., Indiana Harbor, Ind., by increasing the size of the unit. Each end of the furnace pan was lengthened 3 ft., giving a present hearth area of 13 x 39 ft., inside the banks, and a depth of 24 in. From this furnace 106 tons is tapped, with a maximum of 114 tons, against 90 tons before the change. furnace is now 63 ft. in length, with an addition of 15 ft. for the two dog houses, making 78 ft. over all.

It is using either oil or tar as a fuel. The uptakes, which formerly were 48 in. square, are now 50 x 84 in. Slag pockets are 13 x 14 ft., with a height of 9 ft. to the arch. Regenerators are 25 ft. long and the brick goes 12 ft. above the 4-ft. rider walls. These chambers are 14 ft. wide for air and 8 ft. for gas. The spring of the arch is 19 ft. above the bottom of the chamber. The increase of life on the furnace roof has been from 289 to 430 heats. The backwall is now lasting from 180 to 200 heats, against the previous 60. Slag pockets have gone up from 200 heats to 430 and in one case to 461.

Increasing the length of a furnace from 34 ft. 6 in. to 36 ft. and increasing the charge from 80 tons to 125 tons without changing the regenerators was reported as wholly unsatisfactory, by Howard McClelland, open-hearth superintendent Republic Iron & Steel Co. This furnace operates on producer gas.

Practice on a 40-ton furnace in the plant of the Commonwealth Steel Co., Granite City, Ill., was reported by C. M. Cook. This is a basic furnace making castings. Stone and scrap are charged first and melted in about 2 hr. to a low level. Then the requisite amount of cold pig iron is added. Mr. Cook reported no more melting loss from this practice than when all of the charge was put into the furnace at once. The time of making the heat was reported to be about equal in the two melts. The limestone proportion was 14 to 15 per cent.

Discussion of Regenerator Practice

General discussion of checkers, as to the best type of brick to use and method of laying them up, together with a number of subsidiary topics, was taken up as the second item on the program. Henry A. Young, open-hearth superintendent Allegheny Steel Co., Brackenridge, Pa., opened the discussion by describing his practice as straight 9-in. brick on small regenerator chambers, using natural gas. There are two air chambers at each end of the furnace, with 12,158 sq. ft. of radiating surface. The openings measure 51/2 x 61/2 in. He expressed the opinion that a deep bank of checkers is better than a shallow one. He favors the use of larger brick with a larger chamber. At the end of a run of 200 to 240 heats he takes out about half the checkers, reclaiming many of those removed. About one-third are lost on each run.

Similar brick was reported by C. R. Henry, openhearth superintendent Alan Wood Iron & Steel Co., Conshohocken, Pa. In this case the openings are $4\frac{1}{2}$ in. About 65 per cent of the brick are reclaimed after a run. The surface was given as 175 sq. ft. to the ton, with the furnace tapping an average of 78 tons. Coke and tar are the fuels.

Larger brick are used by many of the companies. William C. Kitto, open-hearth superintendent Pittsburgh Steel Co., Monessen, Pa., uses $4\frac{1}{2} \times 4\frac{1}{2} \times 10\frac{1}{2}$ -in. brick in regenerator chambers measuring about 26 ft. long. These are 7 ft. wide for gas, 10 ft. 9 in. for air, both being 17 ft. 8 in. high to the skewback. There are five rider walls, 21 in. center to center, in the air chamber, measuring 30 in. high and $4\frac{1}{2}$ in. thick. On these are tile $3 \times 10 \times 21$ in. With 29 courses of brick on top, the horizontal opening measures $4\frac{1}{2} \times 6$ in., with 6×6 in. vertical opening. There are 21,410 brick in each air chamber. The volume of the air chamber is 5396 cu. ft., or 58 cu. ft. to the ton. The exposed heating surface is 10,734 sq. ft., or 116 to the ton. The volume of the gas chamber, 3565 cu. ft., is about 39 cu. ft. to the ton.

Reclaiming about 42 per cent of the brick for reuse in checkers, with an additional 6 per cent available for bulkheads, makes a total of 48 per cent. The runs are averaging about 300 heats on a 93-ton furnace, using producer gas and having a bath 15 x 35 ft.

This same size of brick is used by the Weirton Steel Co., and about 300 heats are made to the run. Some two-thirds of these brick are reclaimed after a run. The gas chambers of the smaller furnaces in this plant, however, use 9-in. straight brick. Inadequate regenerator capacity, with the use of the $4\frac{1}{2} \times 4\frac{1}{2} \times 10\frac{1}{2}$ -in. brick, was reported by Robert L. Cain. He stated that it probably would be necessary for him to use smaller brick to obtain the required capacity.

As much as 500 to 600 heats on a run was reported by Major James W. Mills, open-hearth superintendent Granite City Steel Co., Granite City, Ill. This is on 58-ton furnaces using oil as a fuel. From one-third to one-half of the brick are reclaimed after the run. There are 30,000 brick in four chambers, each chamber measuring 8 x 17 ft., with a height of 12 ft. to the arch.

Getting Away from Fire Clay Brick

Silica brick in checker chambers was reported by Ernest A. Smith, open-hearth superintendent Andrews Steel Co., Newport, Ky. One furnace on these brick has run as high as 810 heats. Another one, which is still operating, has reached 550 heats. These brick are $3 \times 4\frac{1}{2} \times 12$ in. and there is very little of them left for reclaiming after a run—possibly 25 per cent. Producer gas is the fuel.

Silica brick for the three or four top courses of checkers were reported by Lafe Young, open-hearth superintendent Laclede Steel Co., Alton, Ill. He uses 4 x 4 x 13-in. brick and has 19,640 sq. ft. of surface in the checkers, or 273 sq. ft. to the ton. After a run of 400 to 450 heats he reported a loss of about 10 per cent in brick. The outgoing temperature was given as 1200 deg.

Loftus brick were reported by David G. Baxter, open-hearth superintendent Pittsburgh Crucible Steel Co., Midland, Pa., as being the cleanest he had ever seen in action, even after running for some time. The explanation came from the fact that the sewers were found pretty well clogged up, as the dirt and flue dust were carried from the brick into the sewers. A similar experience was reported by M. A. Smith, general manager Edgewater Steel Co., Pittsburgh. He has 21 courses of Loftus brick on 80-ton furnaces using producer gas and a charge of cold metal. These are in the gas chambers, which measure 16 x 8 ft. 9 in. x 16 ft. high. The time of heat is from 11 to 121/2 hr. and wasteheat boilers are used. There appears to be no change in the fuel consumption and about 300 heats are expected from the furnace.

Burners for oil at 95 lb. pressure were described by C. B. Collingwood. The burner tip is set about 8 ft. from the bath. The burner is a home-made one, con-

sisting of a pipe $2\frac{1}{2}$ in. in diameter, reduced successively to $1\frac{1}{2}$ in. and then to 1 in. Inserted in the $2\frac{1}{2}$ -in. pipe is a piece of $\frac{2}{2}$ -in. pipe having on its sides, near the end, four $\frac{1}{2}$ -in. holes aimed backward into the stream of steam in the larger pipe. Superheated steam is used for atomizing, at 85 lb. pressure for melting and 60 lb. for finishing. The run of the oil and steam mixture to the furnace is about 30 ft. Consumption of oil is about 50 gal. to the ton of ingots on the 40-ton furnaces and 40 gal. on those of 50 tons.

A dry burner with tip about 5 ft. from the bath was reported by H. B. Hubbard, open-hearth superintendent Inland Steel Co., Chicago. The oil is heated to 200 deg. Fahr. and is atomized by using superheated steam at 120 lb. pressure. This pressure is reduced to 90 lb. after the charge is melted. Consumption was reported as averaging 34 gal. to the ton of rail steel.

Variation in oil consumption between 34½ gal. to the ton when running with hot metal and 40 gal. when using cold metal was reported by W. F. Davis. As the Indiana Harbor plant has no mixer, the ladles of metal have to be taken as they come from the blast furnaces.

Oil at 150 lb. pressure, with dry steam at 175 lb. was reported by Frank A. King, Weirton. Oil at 175 lb. and steam at 125 lb. are used by the Laclede Steel Co., as stated by John W. Gething, superintendent. On a cold charge the consumption is 34 gal. to the ton on 80-ton furnaces using 6 per cent of burnt lime.

On a straight suspended roof at the Donner plant Mr. Muir expects to obtain from 450 to 480 heats, there being already 410 heats out on the present run. The time of heats was given as averaging 11 hr.

Special Ports Favored by Several Men

Unlined Blair ports are giving good satisfaction, in the opinion of N. F. Egler, Valley Mold & Iron Corporation. They are easy to install or to change, having fixed dimensions. About 700 heats are being obtained on the gas checker chambers, while the air chambers, after 200 heats, become pretty dirty. For 150 heats the average time has been near 9 hr. each.

Brick-lined Blair ports run dry at the Trumbull Steel Co. were discussed by George D. Cain, openhearth superintendent. The furnace had 199 heats already out, with an average of 12 hr. each. The checkers appear clean. Coal consumption, using producer gas, has been 448 lb. to the ton of ingots, compared with 510 lb. for unlined Blair ports, water-cooled.

With piped ports, Mr. McClelland stated that the nose of the port stays in very good shape, but that there is a certain amount of cutting away behind the pipe. The original size of these ports was 21 x 30 in., but all of them have since been made smaller.

Speeding Up Furnace Repairs

Steel arch centers, without intermediate support, are used by the Colorado Fuel & Iron Co. in making hot repairs. Mr. Stuart said that no wood is used anywhere in the process. Semicircular steel forms are used in the flues. Two laborers can put in the centers. The masons then work from above them and are not exposed to severe heat at all. After the forms have been used for half the length of a furnace, on a general repair, they are then reversed and used for the other end.

Brick, 4 x 4 in., are put at each end, on the skew-back supports, and the center rests on these. When the job has been done, the brick are knocked out from under. The center then drops and is easily pulled out. No one has to go inside the furnace. Use of steel centers was reported, also, by C. R. Henry, of Alan Wood.

Metal forms are used at the Ashland plant of the American Rolling Mill Co. Mr. McCutcheon stated that rail sections are suspended by overhead wires at the two skewbacks to hold the form. The latter is moved along a ring at a time. In general repairs rails are laid across the furnace, resting on brick piers. A steel "flooring" of sheets is placed on the rails and wooden centers then are used above the steel sheets. Complete protection is thus afforded the men and the centers from the residual heat of the bottom.

At the plant of the Sheffield Steel Corporation, Kansas City, no centers are used. T. T. Scott, openhearth superintendent, reported using a form of hook brick. The roof is laid up with ribs to facilitate the use of this type of brick, each unit of which hooks over the adjoining ring, hanging from the rib. A great deal of hot patching is done here.

Slag Cars as a Time Saver

Use of slag cars in the slag pockets was stated by John E. McCullough, National Malleable & Steel Castings Co., Melrose Park, Ill., to be one of the greatest improvements in open-hearth practice in recent years. In his plant the checkers are directly underneath the furnace, and are accessible from both sides. The car is made of a semicircular steel plate, lined with 41/2-in. brick and with sand over the brick. It is on rollers, and is hauled back and forth through use of the crane operating through a snatch block. Steel cable is used on the pit side, but for the connection under the furnace, where great heat is encountered, steel chain of large links is substituted.

This car has capacity for the accumulations of three to five weeks near the beginning of the run, diminishing to two weeks at mid-run and being changed every week (Saturdays) as the end of the run approaches. It takes about 134 hr. to take out the car, remove the slag and return the car to its place. The joint is made by 3 x 3-in. angles, with a row of brick laid on them. These are adjusted while the car is outside the heat of the pit. After it is back in place, sand is placed on the brick by means of long-handled spoons, making a sloping surface up to the walls. Mostly liquid slag is gathered here, with some stalactites. The cars are pulled before they get so full as to promise trouble in getting them out.

Blasting Out Recalcitrant Slag

Dynamite is resorted to in many plants to get the slag out. Mr. Stuart stated that in the Colorado plant a water-cooled drill is employed in preparing the hole for the dynamite. When using a long fuse there is the trouble that the dynamite and fuse will both burn up, to no avail in removing slag. Hence a 10-in. fuse is used, by a man familiar with explosives, and no trouble has been experienced with it. By this means four pockets are cleaned out in a day, using eight men.

No damage to the furnace is caused by this method, in the opinion of G. D. Tranter, provided the dynamite is used to undercut the slag. He reported getting into the slag pockets 8 hr. after a furnace goes off, and having them clear in 48 hr. He uses a drill for the holes and shoots the charges from the bottom of the

Other Methods of Cleaning Slag Pockets

Prying the slag loose is the practice of some of the plants. At the Republic plant air drills are employed to make holes for 8 x 8-in. billets 35 ft. long. A fulcrum is set close to the pocket and then the crane places a ladle or other heavy weight on the outer end of the billet. At the Wisconsin plant the slag is undermined back to the slope. Then the 100-ton crane and a big monkey hook are used to get the slag out. The whole process averages 48 hr. In this case there is a layer of 8 or 10 in. of sand in the bottom of the pocket and the slag volume is 7 or 8 ft. thick.

Tapping out the slag was tried both at the Brier Hill plant and at the Campbell plant of the Youngstown Sheet & Tube Co. At both places it was found too cold to run freely enough to make the attempt a success.

Use of a 12-in. sand bottom and a false wall of loose brick 4 to 6 in. thick and 5 to 6 ft. high was reported by M. A. Smith, Edgewater Steel Co., to facilitate getting the pockets cleaned. The process takes 48 hr., and producer gas is the fuel. Squirting in water while the slag is still hot was recommended by Henry A. Young. This, he said, breaks up the slag and enables

him to get it out in 36 to 40 hr. He uses natural gas. Brick-lined cast iron doors are in use in the Ashland plant of the American Rolling Mill Co. to reduce the time required to break seals in getting at the slag. Some doubt was expressed by several members of the conference as to the ease of opening these doors, but Mr. McCutcheon assured the meeting that they can be opened when required.

Cleaning out flues of checker chambers by means of a vacuum cleaner was reported by Howard McClelland. As this resulted in "putting the flue dust all over the landscape," the practice was discontinued. Then an attempt to clear the flues by blowing them out quickly shut down the furnace. It was found that they had been concentrated at the base of the stack in a pile 8 ft. high.

Furnace Insulation Is Only Partial

Insulation 4 in. thick under the regenerators and 21/2 in. thick on the side walls has been installed in connection with the 175-ton furnace at the Republic The flues, also, are lined as far as the stack with 21/2 in. of insulation. Coal consumed in the producers feeding the furnace is about 400 to 425 lb. to the ton. There is doubt as to whether the insulation (C3 Sil-o-cel) or the great size of the heat taken from the furnace is responsible for this good fuel showing. The insulation is put on as a sort of Celite concrete, without any inclosing plate.

One furnace of the Pittsburgh Steel Co. at Monessen, said William C. Kitto, open-hearth superintendent, has the regenerators sheathed with %-in. steel plate. Here the outside walls are laid up with 9-in. brick in place of 131/2-in. and the division wall between chambers is 22½-in. thick instead of 27 in. Two other furnaces have received a ½-in. coating of Weber's 48 insulating cement, put on while the furnace was hot. This cost about \$200 to the furnace, half of which was for the material. Both these methods have stopped a great deal of air infiltration.

Outside the checker chambers at the Inland Steel Co. is a 41/2-in. Sil-o-cel brick wall, for insulation. Two new furnaces at the Ashland plant of the American Rolling Mill Co. are insulated from the stacks to the bottom of the uptakes. The flues have received C3 concrete, while the regenerator chambers are covered with 21/2-in. of Sil-o-cel "natural," both on sides and roof, being covered with a slurry to avoid air infiltration. Fantails have $4\frac{1}{2}$ -in. burned brick (C22) underneath and $2\frac{1}{2}$ -in. of the same material on the roofs.

At Portsmouth, Ohio, C. H. Moreland reported, the Wheeling Steel Co. has insulated furnace flues with 2½-in, brick. John W. Gething stated that the Laclede Steel Co. uses insulation over the checker chambers and carries it up to the floor level. Above the floor a silica cement 1/8-in. thick is smeared over the furnace.

VEXT week the two remaining sessions of the conference will be covered: Furnace Operation Problems and Control of Steel Quality.

Locomotive Shipments Drop Again

Total shipments of locomotives from the principal manufacturing plants in the United States are reported for April by the Department of Commerce at 46 units. This is the smallest number in many months. pares with 70 in March and with 98 in April a year ago. For the first four months the total was 222, against 372 in the first four months of 1927.

Only two of the April shipments were on foreign account, both being steam. This compares with nine in March and with an average of more than 14 a month in 1927. Of the locomotives on domestic account, 38

in April were steam and six electric.

Sales billed by the General Electric Co. in the first three months of 1928 amounted to \$71,640,790.40, compared with \$72,474,474.03 for the corresponding period last year. Profit available for dividends on common stock was \$11,261,842.71 in 1928, compared with \$11,-028,143.96 for the same three months last year.

The American Rolling Mill Co., Middletown, Ohio, has announced plans for amending its charter to authorize the increase of its capital stock from \$30,000,000 to \$50,000,000. The new issue will consist of 800,-000 shares of \$25 par common.

Purge Business of Corruption!

Judge Parker, Addressing National Chamber of Commerce, Demands Turning Out Those Who Flaunt Laws—General Motors Official Describes Forecasting Plan

Washington Monday and continues through Thursday, dealing with a wide range of business problems under the general head of "Team Play for Prosperity." The keynote was sounded by Judge Edwin B. Parker, chairman of the Chamber's board of directors, who, in vigorous terms, called upon organized business to cast from its ranks those business men who by their ruthless acts bring discredit upon business as a whole. Judge Parker declared that stockholders of corporations have the duty of publicly repudiating those who misrepresent them by amassing profits through corruption.

"The times demand straight thinking and frank speaking," he said. "They demand that we consider the disturbing evidences of business atavism—of a throwback to a day of unrestrained individualism; a day of the 'public be damned,' when men of great business ability with an eye single to their own selfish interest and immediate returns, and without regard to the future, ruthlessly pursued their predatory lusts in a

spirit of 'after me the deluge!' '

Reference was made to recent conspicuous examples of prominent business men becoming involved in transactions tainted with fraud, but, he said, they are not peculiar to this day nor to the profession of business. He demanded to know whether the business community as a whole shall lose the ground it has painstakingly and deservedly gained that a few—a very few in relation to the vast host engaged in American business—"may crash through and demolish the canons of sound business practices." Many Congressional investigations, it was asserted, are of the highest value to the public, including business.

Unless business purge itself of those who flaunt the law and abuse their power, said Judge Parker, the public will "turn loose thunderbolts of wrath which inevitably will bring legislative and governmental regulation of business to a degree that will seriously hamper a legitimate freedom of business initiative."

Addressing the manufacturing group, E. J. Mehren, vice-president McGraw-Hill Publishing Co., New York, presented shrinking profits as one of the most ominous trends in business.

The difficulty was held to have its genesis in overcapacity and to include the craze for volume, overproduction, obsolete equipment and consequently high manufacturing costs, intense competition, a mobile and even fickle buying public, high selling costs, price profiteering by buyers and price cutting by sellers.

"We need, first, to supplant the craze for volume by a reasonable passion for profits," said Mr. Mehren. "And, second, we need to eliminate buyers' profiteering,

and the accompanying price cowardice.

"At the very root of our difficulties lies the craze for volume. We'd sooner have volume than profits. A full factory and red ink seems as popular as 60 per cent operation and plenty of black. Craze for volume, swollen sales expense to get the last 20 per cent of business, ruinous prices to fill up the factory; the goal is volume, not profits.

"We fail to realize that the law of diminishing returns cannot be flouted. The nearer we get to perfect performance the smaller the gain for given effort. It can't be escaped. The top business costs more than it is worth and only injects an undesirable color scheme

into our balance sheets."

Mr. Mehren declared that the opportunity is present for beneficent propaganda, "for spreading a fire of sound business doctrine the country over; for creating through trade associations and chambers of commerce a country-wide sentiment for restoration of fair

profits as our business goal."

The second revolution was held to relate to buyers' profiteering and its accompaniment, "price cowardice." It was declared that they do not exist in every industry or trade, but that a large section of business is suffering from them. The buyer, it was stated, beset by hungry sellers, has the seller on the run and plays one seller against another until the price is down not merely to rock bottom, but "in a hole blasted deep in the rock by the combined dynamite and T. N. T. of buyers' profiteering and price cowardice."

Mr. Mehren wanted to know of the manufacturers if they are practicing on others what they condemn when practiced on them, inquiring if their purchasing agents

are profiteers and price clubbers.

"Put your own purchasing right," he said, "and the reformation will have been started. You can, then, with clean hands carry this propaganda into your own circles of influence."

Forecasting Methods of General Motors Corporation

SPEAKING of the experience of the General Motors Corporation, Donaldson Brown, vice-president of that organization, told the manufacturing group that he believed and hoped that some day American business and industry will approach the ideal of stabilization sufficiently to free them from the bogey of the business cycle. He spoke on "Forecasting and Planning Vital to Industrial Prosperity."

"When this is brought about," he said, "it will be very largely due, I am sure, to the closer and more economical control of industrial and merchandising operations that will follow a better appraisal of ultimate consumer demand. And intelligent forecasting and planning—vital to business prosperity—is the mechanism to bring this about and to remove the unnecessary hazards from the course of American business."

Contrary to the view of one group which still regards "the scrawling of the business cycle as almost the handwriting of fate, dictating good business or

bad," Mr. Brown said he was in sympathy with the growing tendency to look upon it as an effect rather than a cause. He declared that, with present facilities in the banking structure, there can be no cause for major disturbances of the business cycle except as brought about from conditions of business itself. He expressed the opinion that, while business is subject to the influence of the business cycle, the business cycle itself-to the extent at least that its fluctuations are of any serious consequence-results from lack of knowledge and from errors of judgment on the part of business management. He recited the plan of General Motors in operation for forecasting future consumer demands and for planning and controlling activities in accordance with the indicated expectations. From General Motors' experience with this plan, he said, he believes its results constitute a distinct step toward the stabilization of the automobile industry. casting and planning he declared to be nothing more or less than a system of control whereby production, purchases of materials and the employment of capital are coordinated with sales requirements. Budgetary control was described as an apt phrase except that it is likely to imply a rigidity that must be guarded against. Flexibility, he said, is a prime requisite so that there may be quick response, and thus the possi-bility of adjustment throughout the system to the requirements of changes of situation that are inevitable. The focal point of the system was said to be the sales output. The flow at this point, said Mr. Brown, must be gaged and every other activity must be coordinated with it. Ultimate consumer demand, it was stated, is the absolutely fundamental factor controlling the continued sale of any product. This was said not to be the demand of the manufacturer who buys from some other producer, but that of the user of the final and completed product.

"Some businesses are more fortunately situated than others as to the opportunity of analyzing the ultimate consumer demand for their product," said Mr. Brown. "Those that are producing and selling products which represent a preliminary stage in the manufacture of a final product that in course of time finds its way into the hands of the ultimate consumer are far removed from such an opportunity. They are nonetheless dependent upon the requirements of the final consumer; and it is poor solace to place the responsibility elsewhere, when an unrecognized state of demand results in a decrease in sales and an enforced curtailment of

production."

Effect of Diversification on Employment

The diversification of industry made possible by the economic law of diminishing labor per unit of production, it was said, has a direct bearing upon employ-

"For while regularization of employment in industry depends upon the correct adjustment of supply to consumer demand," Mr. Brown said, "the growth of employment and wages depend upon continuing increase in efficiency and diversification of production as well as upon the growth of consuming power. Unemployment which progressively and in temporary stages may result from efficiency is of constructive benefit in itself. It results adversely only when industry fails to grasp the opportunity thus presented of increasing diversification of production and building additional consuming power by the employment of the labor thus rendered available. A knowledge of consumer needs and adaptability in meeting them is required to take constructive advantage of such an opportunity.

"There is another kind of unemployment that is an unmixed evil from the economic standpoint. It is that which results from a temporary curtailment of production. The labor thus rendered idle is not available for the production of other products which might attract the public fancy, except at the expense of a labor shortage or deficiency in the original line when resumption of activity occurs. Overproduction, due to mistaken appraisal of consumer demand, seasonal fluctuations, style changes, the development of substitutes, or insufficient information regarding accumulated stocks are causes of this sort of forced curtailment and unemployment."

Correct Appraisal of Public's Needs Essential

A theoretically perfect coordination of business was declared to comprehend an exact knowledge in advance of what the public wants and an exact knowledge of how much the public wants. Such a condition, Mr. Brown said, would mean that there no longer would be reason for worrying about the business cycle. The situation in 1921 was cited to illustrate the disastrous economic consequences of wrong appraisal of consumption demands. False values, Mr. Brown stated, were built up by the period of inflation during 1919 and 1920 and exaggerated expectations of future demands were created by the competitive buying of raw materials and semi-finished products by manufacturers of all kinds. A state of overproduction, it was said, existed, but was not recognized. The cause of this situation would not have appeared, it was said, if there had been a way to detect the true state of consumer demand. Mr. Brown said one reason why the automobile

industry was the first to recover from the 1921 depression was the fact that the automobile manufacturer has nothing between him and the consumer except a dealer organization, leaving no occasion for accumulation of stocks in the hands of numerous intermediaries, thus differing from some other industries further removed from the ultimate consumer.

The two fundamentals in planning by General Motors are of a statistical and constructive character, as described by Mr. Brown. The former is directed toward ascertaining the statistical facts bearing upon future consumer demand. The constructive efforts are directed toward improving probabilities. Statistical information gathered from dealers gives sales and sales forecasts and other items. The constructive efforts concern "long-term" and "short-term" factors of influ-Among the long-term factors of influence, said Mr. Brown, are those relating to consumer appeal in style, functioning, serviceability, etc., and the engineers and salesmen work hand in hand on this subject. Shortterm factors of influence on demand were described, those that may quickly be called into play to offset unfavorable developments. They include special sales stimulus, more intensive advertising, or even temporary under-pricing, whenever these seem called for by a falling off in anticipated and logical demand. Reports are made monthly to cover the ensuing quarter for each division of General Motors and the whole is coordinated into one planning scheme.

Mr. Brown said it was felt the more accurate appraisal of basic requirements and the coordinated control resulting therefrom have formed a distinct step toward the stabilization of the automobile industry. He said that it appears that the stabilization of a multistage industry depends largely upon the proper regulation of commitments in the first stage in accordance with retail demand. After that, he added, with properly applied methods of forecasting and planning, synchronization becomes a matter of one stage keeping

in step with another.

A Worcester Museum of Early and Latter-Day Iron Objects

John W. Higgins, president and treasurer Worcester Pressed Steel Co., Worcester, Mass., will found a museum which will be devoted to objects and literature to give the history of iron and steel, particularly sheet iron and steel, from its beginning to the present day. The project has been incorporated in Massachusetts, the incorporators besides Mr. Higgins being his brother, Aldus C. Higgins, treasurer Norton Co.; Paul B. Morgan, president and treasurer Morgan Construction Co., and Harry G. Stoddard, vice-president and treasurer Wyman-Gordon Co. Plans are making for a museum building 50 by 200 ft., and probably four stories, of steel and glass, to be erected next year. There will be a library room as well as the museum proper, which will be arranged to occupy the complete height of a portion of the building.

The collection as planned by Mr. Higgins will combine art with the working and fabrication of iron. Its nucleus will be a large group of medieval armor, together with arms, displaying the craft of the smiths of Italy, Spain, Germany, France and England in the fifteenth and sixteen centuries. Mr. Higgins has been collecting these pieces for years and has brought to-

gether a great number of them.

It is the purpose to take the collection back to the beginnings, and by authentic objects, if obtainable, and by plaster cast, or at any rate by illustration and manuscript to trace the evolution to the present time. Objects earlier than the tenth century will be of bronze, since very few earlier iron objects have come down. The museum and library will be furnished with fifteenth and sixteenth century furniture, pennants, portraits of men in armor, and tapestries, to afford a suitable background.

The Hamilton Coke & Iron Co., Hamilton, Ohio, has announced the appointment of Eaton, Rhodes & Co., Cincinnati and Pittsburgh, as exclusive sales agents for its Miami Koppers foundry coke and other coke for industrial purposes.

Cooperation Needed to Help Profits

Metal Branch of National Hardware Association Commends Effort to Obtain Modification of Sherman Anti-Trust Law

THE keynote of the meeting of the Metal Branch of the National Hardware Association in Boston on May 3 and 4 was the need for cooperation to bring adequate profits to manufacturers and distributers. The Metal Branch voted to seek the aid of other organizations, including the American Iron and Steel Institute and the Chamber of Commerce of the United States, in advocating a modification of the Sherman anti-trust law as one step in the bringing about of better business conditions.

George H. Charls, president National Flat Rolled Steel Products Association, Cleveland, pointed out the need for cooperation of steel and affiliated interests in

an address, which was in part as follows:

"Today executives require facts and figures on productive capacity, demand, the general and particular trend of business, sales and specifications against contracts, the potential and prospective markets, the inroads of competing commodities, the supply and demand of the material to be purchased, cost comparisons, simplification and standardization of commodities, standardized packing, transportation cost, trade research and sales promotion, labor-saving machinery and its effect upon the cost of manufacture, trade practices and business ethics. It is obvious that such facts must be strictly reliable and up to the minute.

"We must make the sense of frustration which prevails stimulating and useful, by permitting it to lead us to fresh explorations. We must permit a healthy, lawful, decent plan of stabilization extinguish the flicker of sickly, feeble efforts to exist. We must recognize that nothing so quickly destroys confidence and dissolves prosperity as dull vegetation in mindless,

senseless, destructive competition.

"Both the mills and the jobbers seem to have been growing unmindful of their dependency, one upon the other, of their obligation to staunchly support each other in a spirit of mutual helpfulness and protection. The average return on steel industry capitalization in 1927 was 5.22 per cent, the lowest in recent years. While production declined less than 8 per cent from the record output of 1926, earnings declined 24 per cent.

Iron and Steel Prices Comparatively Low

"Iron and steel prices are now 38 per cent over the 1913 level; other industrial products about 50 per cent. Iron and steel wages are 125 per cent over the 1913 level, and freight rates are practically double the 1913 basis. American business faces the necessity of collective effort to resist foreign growing trade and business practices, which, though not unethical, are

uneconomic.

"It is well known to you and it must be apparent to all who are informed that if the price of sheets and strips is further beaten down, wage reductions may be precipitated. It is possible that if these wage reductions are forced on the manufacturers of steel as they have been forced on the brick and textile industries, they will have a tremendous influence on other industries. This may mean a decrease in purchasing power all over the country. He who flagrantly slashes prices, as well as he who just as flagrantly heckles the seller and breaks them down, cannot deny or ignore his responsibility when the facts show conditions to be as they are today."

While the seriousness of the business situation was stressed throughout the two-day session, many other subjects came up for discussion, such as simplification or standardization, merchandising policies, business relations, direct mill shipments, delivery costs, market

channels, etc.

In relation to the question of improving merchandising policies and business relations, Chapin E. Harris, Brown-Wales Co., Boston, maintained the steel

mills should take a greater interest in the warehouse and in the distribution of steel and steel products, but he feels that the greatest good can come from cooperation between the jobbers themselves.

Standard Sizes for Steel Roofing Sheets

A report of the sheet steel simplification committee was presented by the chairman of that body, W. L. Latta, Wheeling Steel Corporation, Wheeling, W. Va. It stated that at the October meeting a summary of a survey made by the Division of Simplified Practice, Department of Commerce, contributed by 14 manufacturers was presented and a 51 per cent adherence to roofing sizes and gages was indicated. A similar survey just made by that division disclosed that 18 manufacturers had reported and that adherence had advanced to 55 per cent. The report further stated:

vanced to 55 per cent. The report further stated:

"The importance of sheet steel as a roofing material justifies the publication of standard gages and sizes in a separate simplified practice recommendation; that the title of that recommendation shall be 'sheet steel roofing'; that the present portion of the sheet steel recommendation as applies to roofing and siding be reaffirmed and republished without change; that the following paragraph be added and incorporated in the established standards: 'Standard weight subject to the usual mill tolerances of 2½ per cent plus or minus.'"

In connection with the simplification of sheet steel it developed in discussion that demands in various parts of the country vary. It was shown that No. 29 gage gutter stock is still sold in the South and in some other sections of the country, but has been practically eliminated elsewhere, No. 28 gage being the minimum standard. It also developed that 2½-in. conductor pipe is demanded in certain sections of the country and that rather than lose customers demands are being filled.

Where demands for these now odd sizes are made, orders are treated as specials and an extra charge is made. F. O. Schoedinger, Columbus, chairman of the association, felt that the making of No. 29 gage stock was retroactive and the situation sufficiently serious to warrant the appointing of a committee to make a report on the matter at the next meeting of the association. He appointed the committee.

In connection with this subject, H. R. Colwell, Division of Simplified Practice, Department of Commerce, Washington, quoted from the editorial from THE IRON AGE of April 5, 1928, p. 960, on "Ban the Thin Roofing Sheet."

Address on Continuous Rolling of Sheets

G. F. Ahlbrandt, the American Rolling Mill Co., Middletown, Ohio, gave an address on the process of rolling continuous sheets, and Robert H. Lyon, Lyon, Conklin & Co., Inc., Baltimore, spoke on present conditions concerning mill direct shipments. A. L. Philbrick, Congdon & Carpenter Co., Providence, R. I., and chairman of the overhead expense committee of the National Hardware Association, discussed expenses of the sheet metal distributer as applied to sales.

Subjects that came up for discussion included methods to be employed to increase the use of terne plate, the report of the terne plate simplification board of review, of which L. D. Brueckel, Weirton Steel Co., Weirton, W. Va., is chairman, the justification of free truck delivery of sheet metal as based on margin of profit, and channels for marketing sheet steel seconds.

L. D. Mercer, Central Alloy Steel Corporation, Massillon, Ohio; F. J. McNeive, W. F. Potts, Son & Co., Inc., Philadelphia; John Follansbee, Follansbee Brothers Co., Pittsburgh; G. F. Ahlbrandt, American Rolling Mill Co., and W. T. Ryan, E. P. Sanderson Co., Cambridge, Mass., were re-elected members of the metal committee.

Straight-Line Polishing Machine with Automatic Features

Automatic polishing equipment designated as the Larson straight-line polishing machine, for parts having large flat surfaces such as bumper bars, molding strips, T-squares, etc., is being marketed by the Hanson-Van Winkle-Munning Co., Matawan, N. J.

In addition to straight flat polishing, the machine

In addition to straight flat polishing, the machine is adapted for a number of special polishing and buffing operations through the use of lifting cams for irregular shapes; positive rotating fixtures for circular work, such as automobile lamps; and automatic spinning fixtures for bolt heads or vanity

ning fixtures for bolt heads or vanity cases. It is claimed that, because of the flexibility of the spindle adjustment and the rigidity of the work platens, almost any hand operation can be duplicated.

An outstanding feature of the machine is the carrier table, which consists of a series of cast iron platens that interlock to form a solid table on which the work is set. These work platens are machined true and are mounted on adjustable hardened rollers. The adjustment provided is intended to assure proper alinement of the top surface of the platens with each other, and to form an adequate base on which to fasten mechanical fixtures or magnetic chucks for holding the work in place. The rollers in turn are run on a rigid track.

The polishing wheels are carried by heavy steel spindles running in double bearings, which in turn are mounted on heavy yokes controlled by compensating springs. This construction is emphasized as providing proper support for the heavy polishing wheels and permitting uniform pressure of wheels against the work. It is also said to permit longer

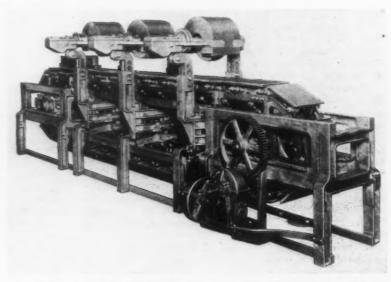
life of the abrasive and wheels, and prevent excessive

spindle bearing wear.

The spindles are adjustable to any pressure and are arranged to oscillate over the work, this combination of balanced spring pressure and continuous to and fro movement of the spindles being intended to provide the constant movement of the wheel over the face of the work that is effected by the skilled polisher. The oscillating motion may be eliminated on the last spindle to straighten the high-light marks. For all cutting operations, the polishing wheels should rotate opposite to the direction the work is taking; but for final finish, the last wheel may be rotated in the opposite direction so that the work goes in the same direction or, "with the wheel to fan" the work. The spindle yokes and wheels may be set at various angles so that each succeeding wheel will polish or buff out the marks left by the preceding wheel by cutting across them. Any number of polishing wheels can be used, the ma-

chine being built on a sectional basis, permitting a long or short delivery and feed end to suit conditions.

Movement of the table is controlled by foot levers placed both at the delivery and receiving ends. The table may be brought to a dead stop quickly by pressure of the foot clutch. When the table is started the spindle heads lower the polishing wheels automatically to the work. When the table is stopped the wheels are lifted automatically. When in operation, the work platens carry the parts to be processed under the polishing wheels which are set at predetermined heights. Each wheel takes but a slight cut. By using three or more wheels the total amount of material removed at



In Addition to Straight-Line Polishing, the Machine is Adapted for a Number of Special Polishing and Buffing Operations

one handling is multiplied, and production is correspondingly increased. The first wheel may be coated with a coarse abrasive, while the final or finishing wheel can be coated with fine abrasive to produce the best surface for plating or buffing. The polishing wheels may be run dry or greased with tallow and supplied with hoods for connection to exhaust systems, or the work may be lubricated by the use of a coolant oil system with screened reservoir tank.

The polishing wheel may be driven either by motor or by an overhead countershaft. Tex-rope drive, with necessary pulley and motor platform, can be furnished also. The speed of the platens, usually 12 ft. per min., can be altered to suit various conditions. For average polishing, each head requires 3 hp. and the platen drive from 1 to 2 hp. The machine illustrated occupies a floor space of 3½ by 14 ft. and weighs approximately 4500 lb., exclusive of motor, magnetic chucks,

or other attachments for special jobs.

Equips Board Drop Hammer with Roller Bearing Heads

Board drop hammers built by the Chambersburg Engineering Co., Chambersburg, Pa., are now avail-



With the Roller Bearings, Lubrication Is Assured Over Long Periods and Oil Does Not Reach the Drop Hammer Boards

able with the rolls mounted in roller bearings, as well as with the plain bearings as heretofore.

Savings in power and better maintenance of alinement are claimed for the application of the roller bearings, and also the elimination of interruptions due to oiling and the changing of bushings. It is pointed out that although hammers are usually oiled at least twice daily, the lubrication is not always complete and the oil frequently finds its way to the boards, shortening the life of the boards materially. With the roller bearings, which are packed with lubricant, it is claimed that adequate lubrication is assured over long periods without oil reaching the boards.

Some 343 advisory committees from industry are now cooperating with the Department of Commerce and upward of 1400 conferences with business leaders have been held. The committees feed into the Department of Commerce economic information and views of industry as to Government policy and at the same time take back to industry scientific information and group decisions as the result of group discussions of common problems.

Horizontal Drilling and Tapping Machines for Production Work

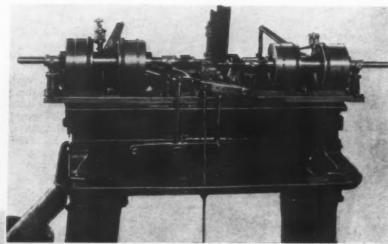
Simplicity of construction and adjustment and highspeed operation are features emphasized in connection with new horizontal combination drilling and tapping machines which have been placed on the market by C. B. Mahan, 162 Longview Terrace, Rochester, N. Y. The machines are available in single or twospindle, and in bench and floor types. It is claimed

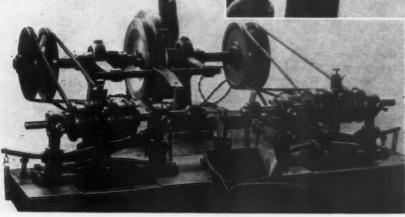
that taps have been run on these ma-

chines at speeds up to 2000 r.p.m.

The horizontal design is said to simplify jig construction, obviate trouble from dirt and chips and eliminate the weight and backlash of the spindles. The machines may be set to tap to a definite depth, the tap reversing automatically when it bottoms. Differences in tap leads and cutting speeds are controlled by a spring, the tension of which may be adjusted so that even if the operator should jump on the foot pedal the tap would not be affected.

One of the machines, a floor type combination two-spindle drilling and in daily use, tapping 3400 holes an hour. By shifting the driving belt to the fixed pulley, the machine may be converted into a drilling machine and production up to 4400 holes per hour obtained. By equipping the chuck with a die holder, both ends of a small crank have been threaded at the rate of 1500 pieces per hour. With one side of the machine equipped with a drill and the other side with a tap, production of 1200 drilled and tapped holes is said to be obtained. Another feature stressed is the drilling of two holes very





THE Floor-Type Machine, Above, May Be Used for External Threading, Counterboring, Screw Inserting and Rivet Heading, as Well as for High Speed Drilling and Tapping. The bench-type is shown at left

tapping machine, designated as the model No. 1, is here illustrated. An automatic chucking arrangement is provided and the unit has been used for a wide range of work, including drilling, tapping, threading, counterboring, countersinking, inserting screws, and heading

A machine of the same design, arranged for bench mounting and of much higher speed, is also available. One of these machines, using a 4/36 tap, is said to be close together in one operation. It is claimed that on one job a 4-in. hole is drilled and another beside it, leaving a 1/32-in. wall between them.

A third unit, designated as the No. 3 single-spindle drilling and tapping machine, of bench type, is also available. It is in effect just one-half of the regular machine, and can be used for drilling, tapping, cross drilling, and the other operations for which the twospindle machine may be used.

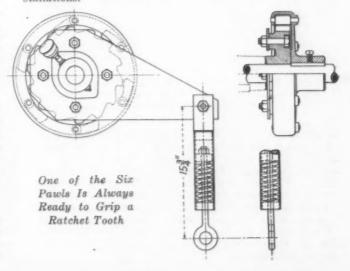
Silent Ratchet Safety Lock to Prevent Backward Run of Loads

To prevent a backward run of the equipment with interruption of power, the Jeffrey Mfg. Co., Columbus, Ohio, has developed a silent ratchet safety lock. It is designed for use with large elevators, pivoted bucket carriers, belt conveyors and similar equipment where vertical lifts are carried. This lock provides protection against spilling a loaded vertical or inclined elevator where an unexpected interruption of power occurs.

As the drawing shows, one of the six pawls grouped around the ratchet is always in position to grip a ratchet tooth. The housing itself is bolted to the countershaft and turns with it when the power is on. The pawls are spaced around the ratchet teeth so that the maximum backward motion of the ratchet is no more than onethird of the distance between the teeth (less than 1 in., even on the largest stone elevator).

Another feature of the safety lock is the spring attachment which takes the jar out of the operation of the mechanism. This spring acts as a snubber on the arm bolted to the ratchet. When the load descends on the pawls the spiral spring takes most of the force of the

blow. This safety lock can be fitted on elevators and inclined conveyors now in use, as well as on new installations.



The Iron Age, May 10, 1928-1325

Bench Machine for Turning, Wiring or Burring Soft Steel up to 18 Gage

A new combination bench machine for turning, wiring and burring operations on 18 gage, and lighter, soft steel has been made available by the Niagara Machine & Tool Works, Buffalo.

This machine, designated as the No. 147-C, is intended for use in the manufacture of sheet metal products and in industrial maintenance work. It is equipped with back gearing and has a one-piece in-



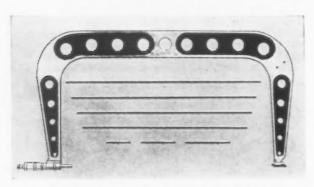
Turning, Wiring, and Burring Faces May Be Interchanged Conveniently

closed frame, which construction is emphasized as providing safety of operation and long life in service. The faces are of steel, hardened and polished, and may be interchanged conveniently for the various operations for which the machine is intended. Regular equip-ment includes one pair of burring faces for each operation, burring, turning and wiring; gage; wrench; and heavy bench stand. The machine may also be furnished as a single-purpose unit with only one pair of rolls for the particular operation required.

Micrometer Calipers with 4-In. Range

Three new micrometer calipers, the combined measuring capacity of which is equal to that of 12 ordinary micrometers of 1 in. range, have been added to the line of the Brown & Sharpe Mfg. Co., Providence.

The smallest of the three micrometers, designated as the No. 90, has a range from 12 to 16 in. The range



Anvils May Be Changed Conveniently and Have Adjustment for Wear. They are held in place positively by a knurled nut

of the next size, the No. 91, is from 16 to 20 in. and of the largest, the No. 92, from 20 to 24 in., by thousandths. The range of measurements of each tool is obtained by four interchangeable anvils of different The anvils may be changed conveniently and are held in place positively by a knurled nut. The anvil cannot revolve but remains in one position in accurate alinement with the spindle. Each anvil has means of adjustment for wear. Clamp rings are furnished for the micrometers, which are available also with metric graduations.

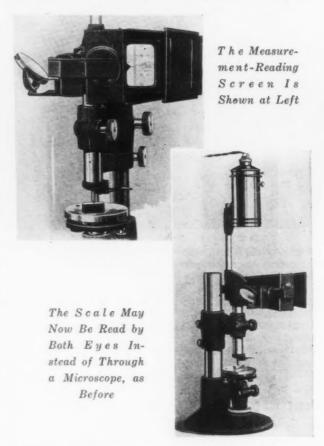
New Optimeter Arranged to Facilitate Reading of Measurements

Means for reading the scale by both eyes, instead of through a microscope, is the principal feature of a projection Optimeter recently added to the Carl Zeiss line of optical measuring instruments, which are marketed in the United States by the George Scherr Co., 142 Liberty Street, New York. In this instrument the optical tube has been changed to permit a lamp holder and a screen attachment to be fitted to it. The image of the scale as it is formed in the ocular is projected through a set of prisms on to the screen, as shown in the accom-

panying illustration.

Reading of the measurements from the screen facilities using the instrument, and without impairing its accuracy in any way, because transfer of the image to the screen is obtained purely by optical means. Because of the greater convenience in reading the measurements the instrument is more adapted to mass inspection work than the previous model of the Optimeter. Application of the Optimeter tube to special fixtures may be made as conveniently as before, the tube and projector being a self-contained unit. Readings on the screen may now be conveniently observed by two or more persons at the same time.

Other improvements embodied in the new design are a table with a serrated instead of a solid surface, and



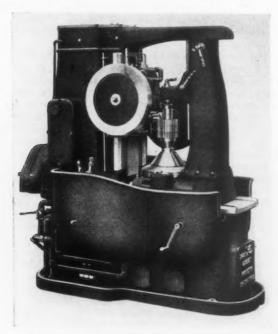
increased range scale to plus and minus 0.005 in. The scale is graduated to 0.00005 in. as heretofore. The projector is also available for horizontal and inside Optimeters.

A large increase in the number of foreman training courses in practically all lines of industry is shown in a survey report issued by the Department of Manufacture of the Chamber of Commerce of the United States. The number of foremanship courses, the bulletin shows, has grown from 105 in 1925 to 933 in 1927. Most of the growth in foremanship courses last year was in the larger industrial States, the outstanding increases for the year having been Connecticut, Michigan and West Virginia. The machinery group, not including transportation equipment, has the largest number of courses, the survey shows. On the basis of the number of workers employed, however, the rubber products and chemicals and allied products groups are far in the lead.

Hobbing Machine for Manufacturing Operations

A hobbing machine designed and built by the Hermann Pfauter Co., Chemnitz, Germany, for high production work in automotive and other manufacturing plants, has been placed on the American market by the O. Zernickow Co., 15 Park Row, New York. The machine has capacity for chrome-nickel and other steel spur gears up to 12 in. in diameter, 5 diametral pitch. The maximum hobbing width is 8 in.

The general arrangement of the machine may be noted from the accompanying illustration. The main drive is by a directly coupled 8-hp. 1500-r.p.m. motor which is mounted on a bracket on the bed of the machine and is started and stopped from the operator's



Convenience of Operation Is a Feature. The machine is intended for quantity production of spur gears up to 12 in. in diameter

position. The hob drive is through spur and bevel gearing and a spline shaft to the hob saddle. An internal-tooth gear cut in one of the flywheels serves to drive the hob spindle. Hob speeds of 62, 89, 125 and 175 r.p.m. are obtainable through change gears.

The hobbing head carries the adjustable hob spindle and the hob driving spindle, which are located one above the other. Each of these spindles carries a large flywheel at its outer end to equalize the torque on the hob spindle. The hobbing head is arranged to swivel 5 deg. each side of horizontal to suit the lead angle of the hob. The hobbing saddle slides on V-ways on the upright and is provided with taper strips for adjustment. The weight of the hobbing saddle is balanced by a counterweight, and the driving shaft is in tension. The dividing gear drive runs in an oil bath. It consists of a worm wheel and a worm which is adjustable both axially and radially.

Gears to be hobbed are mounted on a vertical arbor, which is supported by a horizontal arm and by the bed of the machine as shown, this inclosed rectangular construction being said to withstand stresses without distortion. The horizontal arm of the work support has a movable center. Interchangeable work arbors are provided so that one arbor may be loaded with gear blanks while another lot of blanks is being hobbed.

A number of feed changes, ranging in rate from 0.028 to 0.236 in., are obtainable, and changes may be made by means of a single lever while the machine is in operation. At the end of the cut the hobbing saddle is returned automatically at rapid rate to the starting position by means of a separate motor. Reversing positions for this saddle are set by movable stops. Rapid traverse of the saddle may also be effected by hand. A coolant system is provided.

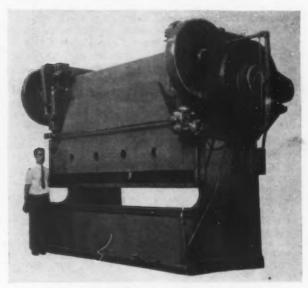
Simplicity of operation is a feature emphasized by the makers. Controls are within easy reach of the operator. After the stops for automatic travel of the hobbing saddle are set and the table is set for correct depth of tooth, the table carriage is locked in position on the bed by means of a single lever. Main shafts of the machine have ring oiling bearings, other important points being lubricated from a central source by means of a pump from which oil is pumped to a distributer which circulates oil through piping to various parts of the machine. The floor space occupied by the machine is 28 in. by 60 in., and the net weight is 5300 lb.

All-Steel Press Brakes With 41/4-In. Single-Plate Housings

Use of a single plate, 4¼-in. thick, for the housings, instead of the double-plate box construction previously employed, is a feature of a new series of all-steel press brakes placed on the market recently by the Cincinnati Shaper Co., Cincinnati.

One of the new machines, which are designated as the No. 120 series, is shown herewith. This unit has capacity for making right-angle bends at one stroke in steel plate % in. thick and 8 ft. long, over a 3-in. die opening, or in steel plate ¼ in. thick and 12 ft. long, over a 2-in. die opening, without overload. It is stated that in previous models of these ma-

It is stated that in previous models of these machines it was necessary to use two 2-in. plates, welded and riveted together, because of the difficulty in getting plates of the required size and thickness rolled



The Method of Mounting the Bed and the Use of a Divided Connecting Rod Are Features

flat enough for this type of construction. Perfectly flat plates up to 6-in. in thickness now being regularly available are said to have made possible the press broke with the single-plate 41/2 in housings

brake with the single-plate 4½-in. housings.

The bed and ram plates are 3 in. thick. The bed extends below the floor line from 18 to 28 in., depending upon the length of the machine. Because of the method of mounting the bed, and the divided connecting rod, a patented feature, the loads are said to be carried directly up and down the center line of the housings, and to this is attributed practical elimination of deflection and greater capacity with the same factors of safety. Other features include automatic oiling, anti-friction bearings on high-speed shafts and in the mounting of the flywheel, disk clutch of special design, over-size brake drum, liberal depth of bed and ram plates, and screws of high carbon and high nickel steel, cut with buttress thread. A dovetail slot is planed along the length of the bed, both front and back, to receive gages or other fixturees. The ram is raised and lowered by means of an independent motor drive, which is standard equipment.

The machines are arranged for motor drive, and the motor is connected by Texrope drive to the flywheel. Standard lengths furnished in this series range from 6 ft. 6 in. between the housings, with a die surface of 8 ft., to 12 ft. 6 in. between the housings, with a die surface of 14 ft.

PROTEST REDUCED RATES

Pittsburgh District Steel Makers Object to Proposed Decrease in Chicago—New Orleans Freight Schedules

Washington, May 8.—A strong protest has been filed with the Interstate Commerce Commission by Pittsburgh district steel manufacturers, the Pittsburgh Chamber of Commerce, the Eastern Trunk Line railroads, the Baltimore Association of Commerce and other interests in the East, asking that the commission suspend tariffs filed by the Illinois Central Railroad establishing reduced rates, effective May 31, on iron and steel products from the Chicago district by way of New Orleans and the Redwood Line steamers to Pacific Coast ports. The proposed rates range from 56c. to 86c. per 100 lb., and would be a reduction of 8.5c. per 100 lb. By the schedules it is the plan of the Illinois Central to reduce its rate on this traffic from Chicago to New Orleans from 39.5c. to 31c.

The protestants declare that the schedules would set up discrimination against Eastern steel producers who ship to the Pacific Coast through Eastern seaboard ports by way of the Panama Canal and would deprive them of Pacific Coast business. It is also contended that the proposed rates would take traffic from the Eastern lines and put into effect a set of low rates over the Illinois Central that are not justified. Intimation is made that, should the reduced rates be allowed to become effective, reduced rates from the Pittsburgh and other Eastern districts would be demanded and a rate war for the steel business of the Pacific Coast be declared.

Reductions for Many Products

An idea of the proposed rates on various steel products is given in the following list, stated in cents per 100 lb. and covering carload shipments, mixed or straight, of 40,000 lb. per car, except in the instance of raw and semi-finished steel, which would be allowed a maximum of 50,900 lb.:

A rate of 56c.; tin and terne plate.

A rate of 61c.; ingots, billets, blooms, muck bars, wire rods in coils, band, bar and hoop steel, rods, slabs up to 6 in., strip steel, plates (not ship or boiler), plain or punched shapes and bars, boiler flues, pipes and tubes not over 12 in. in diameter and 35 ft. in length and plates and sheets No. 16 gage or thicker.

A rate of 66c.; bolts, nuts, rivets, washers, turnbuckles, chaplets, dowel pins, hoops and wire, spikes, staples, barbed, galvanized and painted wire, pipe fittings, couplings and valves.

A rate of 71c.; plates and sheets No. 17 gage or

lighter.

A rate of 86c.; wire and wire goods in bundles, wire bands, fence steel, fencing wire and netting wire.

The Pacific ports of destination are Alameda, Los Angeles, Oakland and San Francisco.

The purpose of the Illinois Central schedules is declared to be to equalize Chicago with Pittsburgh and other Eastern points in rates on iron and steel to the Pacific Coast ports, although the schedules embrace other products as well. The proposed 31c. rate from Chicago to New Orleans is identical with the rate from Pittsburgh to Baltimore, while the rates from Pittsburgh to Philadelphia and New York are 32c. and 34c., respectively.

Pittsburgh Makers' Demands

The Pittsburgh Steel Co., in its protest, says that it feels that the Chicago-New Orleans rate should not be less than the domestic rate of 55c., pointing out that the Pittsburgh producers have to pay domestic rates to Atlantic Seaboard ports. The Pittsburgh-Des Moines Steel Co., Pittsburgh, after asking withdrawal of the proposed Illinois Central rates, declares that if this is not accomplished the rates from Pittsburgh, Youngstown and Cleveland to Baltimore should be reduced to a relative amount, that is on the basis of the same rate of 31c. from Chicago to New York, with the Pittsburgh rate 60 per cent of that rate. 18.5c., and the usual differentials under to Philadelphia and Baltimore of 2c. and 3c., respectively.

The Central Tube Co., Pittsburgh, opposed the tariff

as being "vicious," and asked that it be suspended indefinitely. This company said that the proposed adjustment appeared to be a decided discrimination and a deliberate attempt to divert Pacific Coast business from the Pittsburgh district to other sections not so favorably situated. Similar protests were made by the Union Drawn Steel Co., the Page Steel & Wire Co. and other producers.

Position of Carriers

The Eastern Trunk Line carriers said that the proposed and similar rates, as made applicable from Chicago, are also to be applied as maxima at Ohio River crossings of the Illinois Central Railroad, under the recognized rate relationship policy of the Southern carriers, and will undoubtedly be made applicable also from Ohio River crossings as far east as Cincinnati, thereby unbalancing the relationship of commodities in Eastern territory to the serious embarrassment of the carriers serving them.

"The establishment of any rate from Chicage and other Illinois points by the use of subnormal or special rates to New Orleans as the basis for the inland proportion would force more easterly producers to demand protection by relative proportional rates from their shipping points to the North Atlantic seaboard in order to restore the now existing rail relationship of rates to the respective ports made with respect to rail distances," said the carriers' protest. "The necessity for protecting communities is most pressing, and disastrous and wholly unnecessary rate reductions would undoubtedly follow the effectiveness of the proposed rates, transferring to joint rail-and-water routes thus created the chaotic rate conditions which have for a long time characterized the intercoastal steamship port-to-port rate situation."

The Baltimore Association of Commerce declared that the establishment of the proposed rates would tend to attract traffic from Eastern seaboard points and from the routes through the port of Baltimore and thus injuriously affect the shipping of that port. Any appreciable loss of tonnage, it was said, would affect the prosperity of the intercoastal lines operating from Baltimore, contrary to the intent of the transportation act.

A point made generally by the railroads and other protestants also was that the Chicago-New Orleans rate now is lower, mileage considered, than the rates from Pittsburgh to Eastern ports. The distance from Pittsburgh to Baltimore is 312 miles, while from Chicago to New Orleans it is 921 miles.

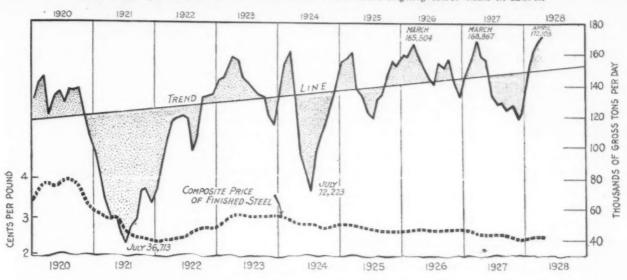
British Tin Plate Industry 200 Years Old

On April 26 the British tin plate industry celebrated its 200th anniversary. It was on that date 200 years ago that a method of rolling plates out of iron was discovered at Pontypool, South Wales. Prior to 1728 they had been beaten out with tilt-hammers, a very slow and laborious process which did not produce the smooth plates obtained by rolling. By 1776 works in Wales were exporting tin plates all over the world. Napoleon offered a prize in 1800 for a method of preserving food, and this was won by M. Appert.

Twelve years later Peter Durand, a London merchant, took out a patent for preserving food in tin "cannisters," which laid the foundation of the canning industry. It is estimated that 50,000,000 cans of food are consumed daily throughout the world.

To Push Intensively on Steel Frame House

The Steel Frame House Co., a subsidiary of the McClintic-Marshall Co., Pittsburgh, plans to distribute through its own representatives, who are to be located in the principal cities of the country. While there will be close cooperation with the branch offices of the parent company, the representatives of the subsidiary are to devote their entire time to the sale of the steel frame for housing and other uses to which it is adapted. Edward Moore, with offices at 39 Broadway, is New York representative of the company.



Record Ingot Production in April

Daily Output 2½ Per Cent Ahead of Previous High—The Four Months Period 3½ Per Cent in Excess of That of 1927

PRODUCTION of open-hearth and Bessemer steel ingots in the United States in April was at a new high rate, being 172,103 tons a day (allowing 25 full working days in the month). In March, 1927, with 27 working days, the daily output, revised for the openhearth and Bessemer and not including either crucible or electric steel ingots, was 167,973 tons. Thus the new figure tops the previous record by 2½ per cent. The original estimate for March, 1927, in which crucible and electric steel ingots were included, was 168,867 tons a day, as shown on the diagram.

So far this year, or through April, the output amounted to 16,847,000 tons, or $3\frac{1}{2}$ per cent more than the production of the corresponding four months of 1927. The total for April was not so large as that for March, which had 27 working days, nor so large as March, 1927, which stands as the highest monthly output.

The compilations are based on returns from companies which, in 1927, produced 94.68 per cent of all the ingots made by the open-hearth and Bessemer processes.

Estimating production in April of electric and cru-

cible steel ingots (no longer covered in the institute's monthly figures) at 1400 tons a day, the total April ingot output would appear to have been at the rate of about 173,500 tons for each working day. Details of the past 16 months are shown in the table.

Lake Superior Ore Shipments Small in April

Iron ore shipments from Lake Superior ports in April, this year, were only 5946 gross tons. The record this and last year has been as follows in gross tons:

Port									April, 1928	April, 1927
Escanaba									5,946	148,122
Marquette					0 1			0		59,831
Ashland			9.		0 3		0	0	* * * *	128,044
Superior										518,055
Duluth	* *		*	è	0 1		A	*	5 5 6 X	546,506 159,528
Two Harbors	,	- 0	*	*			*	*		103,028
Total									5.946	1.560.086

The decrease in April, this year, has been 1,554,140 tons from April, 1927.

Decrease in Slab Zinc Output in 1927

Washington, May 8.—Production of slab zinc at zinc reduction plants in the United States in 1927 amounted to 635,300 net tons, valued at \$81,439,000, the output decreasing 23,921 tons or nearly 4 per cent compared with 1926, according to the United States Bureau of Mines. The 1927 production consisted of 576,960 tons of primary metal made from domestic ore; 15,556 tons of primary metal made from Mexican ore and 42,784 tons of redistilled secondary metal. The States having the largest output of primary metal were: Oklahoma, 120,801 tons; Montana, 112,629 tons; Pennsylvania, 106,099 tons, and Illinois, 102,768 tons. The apparent consumption of primary zinc in 1927 amounted to 516,371 tons, a decrease of nearly 41,000 tons from that in 1926.

Having received a sufficient number of written acceptances of the recently revised "Simplified Practice Recommendation No. 51, Die Head Chasers" (for self-opening and adjustable die heads), the division of simplified practice of the Department of Commerce announces that the project is now in effect, as of April 1, subject to annual revision or reaffirmation by the industry.

Production	of	Steel	Ingots*

		(Gross Ton	s)	
Months	Which Mad Cent of the	Companies le 94.68 Per Steel Ingots 927	Calcu- lated Monthly Output All	Approxi- mate Daily Output All
1928	Hearth	Bessemer	Companies	Companies
Jan. Feb March April	3,280,247 3,308,728 3,700,411 3,509,637	498,746 521,366 567,309 564,039	3,991,332 4,045,304 4,507,520 4,302,573	153,513 161,812 166,945 172,103
4 Months	13,799,023	2,151,460	16,846,729	163,560
1927				
Jan Feb March April	3,042,133 3,043,492 3,702,660 3,341,750	545,596 565,226 590,709 565,440	3,789,874 3,812,046 4,535,272 4,127,335	145,764 158,835 167,973 158,744
4 Months	13,130,035	2,266,971	16,264,527	157,908
May June	3,273,593 2,823,107	557,785 486,053	4,047,251 3,495,609	155,663 134,446
July Aug Sept Oct Nov Dec	2,596,349 2,806,347 2,622,977 2,643,562 2,478,627 2,557,955	436,883 505,596 471,548 495,845 481,599 448,154	3,204,135 3,498,549 3,268,881 3,316,292 3,127,015 3,175,484	128,165 129,576 125,726 127,550 120,270 122,134
Total	34,932,552	6,150,434	43,397,743	139,543

*Excluding crucible and electric steel ingots.

Presents Bessemer Gold Medal to Charles M. Schwab

LONDON, ENGLAND, May 3 .- In accepting the Bessemer Gold Medal presented today to him by the Iron and Steel Institute for distinguished merit in promoting the metallurgy of iron and steel, Charles M. Schwab, chairman of the board of the Bethlehem Steel Corporation, said he started his own career as a workman in the steel mills of Pittsburgh in 1879-the same year, curiously enough, in which the Royal Society admitted Sir Henry Bessemer as a Fellow, and the Government of Great Britain honored him with a knighthood.

"May I mention another coincidence," said he, "in connection with the Bessemer medal. The first American to receive this distinction was the famous Peter Cooper, one of the pioneers of American industry. And, oddly enough, you awarded the Bessemer medal

to Peter Cooper in the year 1879.

"You have conferred this distinction upon four other great Americans—Abram S. Hewitt, John Fritz, Henry Marion Howe and Andrew Carnegie. I am proud beyond words to be the next to follow Mr. Carnegie among the Americans to be added to the distinguished British, French and other names which you have honored in this unique manner.

"It is interesting also to reflect that you conferred this distinction upon Mr. Carnegie in the same year, 1904, in which you also honored in the same manner Sir Robert Hadfield, whose name we know so well in America and who is still so intimately identified with

the progress of the steel business."

To the above names of Americans mentioned by Mr. Schwab as recipients of the Bessemer medal are to be added those of Alexander Lyman Holley, 1882, and Albert Sauveur, 1924.—Editor The Iron Age.]

National Machine Shop Meeting in September

A national machine shop practice meeting is to be held in Cincinnati, Sept. 24 to 27, by the machine shop division of the American Society of Mechanical Engineers. Tentative plans announced by L. C. Morrow, chairman of the division, are as follows: Members and guests will embark on a river steamer at noon on Monday, Sept. 24. The afternoon will be spent socially on the boat and after dinner the first technical session will be held. Sleeping accommodations will be provided on the boat. Tuesday morning will be spent in Ashland, Ky., inspecting the continuous sheet-rolling mill of the Armco plant. Tuesday afternoon will be spent socially on the boat. The second technical session will be held after dinner on the boat and passengers will arrive in Cincinnati on Wednesday morning. They will then adjourn to the Engineers Club or some other suitable headquarters, where the third technical session will be held. Wednesday afternoon will be devoted to plant visits in Cincinnati. A dinner will be held Wednesday night. All of Thursday will be devoted to plant visits around Cincinnati.

Two Years' Extension of Mechanical Puddling Experiments

The A. M. Byers Co., Pittsburgh, has secured a two-year extension of its option to buy the plant of the American Puddled Iron Co., Warren, Ohio. The original option was secured as of Nov. 1, 1926. At this plant the company has been developing the com-mercial possibilities of the Aston process of making wrought iron.

The Bridgeport Safety Emery Wheel Co., whose name was omitted from the list of companies published in the May 3 issue of THE IRON AGE which will exhibit at the convention of the American Foundrymen's Association in Philadelphia the week of May 14, will occupy booth No. 118 and will show its line of foundry grinders and sectional grinding wheels. The exhibit will be in charge of I. L. Burritt and W. M. Hyde.

Electrochemists to Discuss Corrosion of Lead Cable Sheath

At the spring meeting of the New York section of the American Electrochemical Society, to be held at the Chemists' Club, New York, on Friday evening, May 18,"The Corrosion of Lead Cable Sheath" will be the subject of a round table discussion. Dr. R. M. Burns, Bell Telephone Laboratories, will open the discussion with a talk on the characteristics of electrolytic, stray current and chemical corrosion of lead cable sheath and the resulting problems in underground cable maintenance. A general discussion will follow, probably participated in by representatives of the principal users and manufacturers of lead and lead alloy covered cables. The New York section invites all those interested in the subject to attend.

Technical Program for Steel Institute's May Meeting

For the thirty-third general meeting of the American Iron and Steel Institute, to be held at the Hotel Commodore, New York, Friday, May 25, the following technical program has been arranged:

"Basic Open-hearth Steel Practice," by Dr. G. B. Waterhouse, professor of metallurgy Massachusetts Institute of Technology, and consulting engineer and

metallurgist, Cambridge, Mass.
"The Effect of Coal Segregation, Mixing and Heating upon the Quality of Metallurgical Coke," by F. F. Marquard, assistant general superintendent Carnegie Steel Co., Clairton, Pa.

"The Manufacture of Alloy Steels," by E. C. Smith,

Central Alloy Steel Corporation, Massillon, Ohio.
"The First Iron Works in America—1645," by Howard Corning, Baker Library, Harvard University, Cambridge, Mass.
"Waste Heat Boilers," by R. H. Stevens, chief en-

gineer Cambria Plant, Bethlehem Steel Corporation, Johnstown, Pa.

"The Trend in Ingot Mold Design," by R. H. Watson, general superintendent Homestead Works, Carnegie Steel Co., Munhall, Pa.

"A Modern Steel Works Power and Blowing Plant," by Wilfred Sykes, assistant general manager Inland Steel Co., Chicago.

These papers will be presented at the morning and afternoon sessions as usual, followed by the banquet in the evening.

National Oil and Gas Power Meeting in Mid-June

The first national meeting of the oil and gas power division of the American Society of Mechanical Engineers will be held June 14, 15 and 16 at State College, Pa., in conjunction with the second annual oil power conference of Pennsylvania State College. There will be an exhibition of engines and accessories, a banquet on the evening of June 15, at which Charles M. Schwab, who is a trustee of Pennsylvania State College, and George Heath, of Carels Diesel & Steam Engines, Ltd., London, will speak and a technical program including papers on the following subjects:

Economic field for small and medium-size Diesel engines, by R. M. Reagle, vice-president Bessemer Gas Engine Co. Economic field for large Diesel engines, by E. B. Pollister, general manager Busch-Sulzer Brothers Diesel Engine Co. Diesel fuel oil, by G. H. Michler, Standard Oil Co. of New York.

Better teamwork among all classes of business as the most effective means of maintaining local and national prosperity will be the central theme of the six-teenth annual meeting of the Chamber of Commerce of the United States to be held in Washington, May 7 to 11.

The semi-annual meeting of the American Gear Manufacturers Association will be held Oct. 11, 12, and 13, at the Statler Hotel, Buffalo, N. Y. T. W. Owen, 3608 Euclid Avenue, Cleveland, is secretary.

German Coal Strike in Prospect

Consumers Replenish Stocks Expecting Suspension-Other European Markets Active -Welsh Tin Plate Mills Well Booked

(By Cable)

LONDON, ENGLAND, May 7.

PIG iron is quiet but the Cleveland furnace output is being absorbed by current demand. Makers are still unable to regain their export markets, but the domestic market, especially Scottish, is now more in their hands. Hematite is dull, but output has been restricted and stocks are diminishing gradually.

Ferromanganese has been advanced 5s. (\$1.22) per ton to domestic consumers, although demand is still slack. Foreign ore is dull, but the Bilbao Rubio price is firm as a result of the continuance of the Swedish

Finished steel business is quiet, except for domestic construction and engineering material. Export trade is quiet in plates and heavy steel.

Welsh sheet bar makers have sold heavily and advanced prices 2s. 6d. (61c.) per ton. Tin plate demand is exceptionally heavy with all quarters buying and inquiring and mills well sold at normal capacity. Prices are strong especially for prompt shipment,

which is difficult to obtain at 18s. 71/2d. (\$4.54) per base box, f.o.b. works port. Forward sales have been recorded at 18s. 6d. (\$4.51) per base box. It is reported that American and German interests are negotiating for the regulation of export markets and prices and that probably Welsh mills will be invited

Galvanized sheets continue dull. Japan has bought some small lots of thin-gage black sheets but the market is otherwise quiet.

The Continental iron and steel market is strong and prices are advancing. Large sales of merchant bars to Japan and Argentina are reported by Continental sellers, but little business is passing through the hands of British traders.

Belgium is reported to be asking for an increased production quota at the next meeting of the International Steel Cartel. French production in March was 856,000 tons of pig iron, a record, and 804,000 tons of steel ingots. At the end of March there were 149 furnaces in blast.

GERMANY FACES COAL STRIKE

Coal Operators Claim Losses Even at Present Wage Scale-Steel Mills Protest Higher Coal Prices

BERLIN, GERMANY, April 20 .- The immediate future of the iron and steel industry in Germany depends to a great extent on the result of a dispute over wages, working hours and prices in the Ruhr coal mines. A week ago, following arbitration, a decision was rendered that all wages in the coal industry were to be increased 8 per cent. The working day, both for underground workers and surface labor, was fixed at 8 hr. This compares with the present working day for underground workers of 7 hr., to which is added an extra hour of overtime. The miners had demanded a wage increase of 1.50 m. per shift.

The coal operators rejected the decision of the arbitration board, claiming that it would increase the cost of production by about 0.75 m. per ton, and threatened to suspend operation at many mines if the Government sought to enforce the decision. At the same time an official commission, headed by Professor Schmalenbach, which had been investigating the financial condition of the German coal industry, reported that the average cost of coal production is 15.62 m. (\$3.67) per ton, while the average yield from sales of coal by the producers is only 14.37 m. (\$3.44) per ton. A minority report of the commission, submitted by Professor Bade, estimates the loss per ton at only 0.36 m. (8.6c.). The difference of opinion was the result of different methods of figuring depreciation and other costs. When the profits from production of coal byproducts are deducted from the losses on coal, the final loss, according to the majority report, is only 0.27 m. (6.4c.) per ton. On the other hand, the minority re-

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.87 per £ as follows:

Bilbao Rubio ore*. 1 2½ 5.48 Cleveland No. 1 fdy. 3 8½ 16.56 Cleveland No. 3 fdy. 3 6 16.07 Foundry pig iron (a):	
Cleveland No. 3 fdy. 3 6 16.07 Foundry pig iron (a):	
controlled and the second of t	
Cleveland No. 4 fdy. 3 5 15.83 Belgium £3 3s. \$15.34	
Cleveland No. 4 forge 3 4 1/4 15.71 France 3 3 15.34	
Cleveland basic Luxemburg 3 3 15.34	
(nom.)	\$14.85
Empro 9 0 40 9 1 14 61 40	14.85
East Coast nematite. 3 10/2 11.11	
Coke 0 18 4 39	
Economic 12 15 CC 07 Billets:	
Deigium 4 12 ½ to 4 15 22.55 to	
Sheet and tin plate C. pe Sheet and tin plate C. pe Belgium 5 8 to 5 8½ 1.19 to	r Lb.
bars, Welsh 5 17½ 28.61 France 5 8 to 5 8½ 1.19 to	
Tin plate, base box. 0 18½ to 0 18½ 4.51 to 5.02 Luxemburg 5 8 to 5 8½ 1.19 to	
Black sheets, Japa- Joists (beams):	
nese specifications. 13 5 64.53 Belgium 4 16 to 4 17 1.06 to	
C. per Lb. France 4 16 to 4 17 1.06 to	
Ship plates 7 12½ to 8 2½ 1.66 to 1.77 Luxemburg 4 16 to 4 17 1.06 to	1.07
Boiler plates 9 2½ to 9 12½ 1.98 to 2.09 Angles; Tees 8 2¼ to 8 12¼ 1.77 to 1.99 Belgium 5 6 1.17	
1111111111111111 0 m/2 to 0 xm/2 xiii to xiii	
	1.44
Beams	
Steel hoops	
Black sheets 24 gags 9 15 to 9 1714 2 19 to 2 14 Belgium 5 5 10 5 5 1.38 to	
Galv sheets 24 gags 12 0 to 18 91/ 282 to 285 Luxemburg 6 3 to 6 5 1.35 U	1.39
Cold rolled stool	
strip, 20 gage, nom. 14 0 to 14 5 3.04 to 3.10 Belgium 6 1 1.34 Germany 6 1 1.34	
Germany	

(a) Nominal.

port indicates a final profit of 0.62 m. (14.8c.) per ton.

Even from the viewpoint of the minority report, which shows some profit for the producers, the coal situation is unsatisfactory. Competition from Great Britain, Poland and even Holland is growing more severe, and the losses from competing with these foreign producers must be borne by the small profits in other markets. Sales of coal in the non-competitive districts of Germany (sections where foreign coal cannot compete) are steadily declining. The average daily sales of the coal syndicate have declined from 271,000 tons in January to 255,000 tons in March, and the average selling price per ton has also decreased.

The Ruhr coal mines have requested permission to increase domestic prices, but the request was rejected by the Federal Coal Council and the Ministry of Industry. It has been calculated that if the unprofitable export trade is to be maintained at the present level the coal syndicate must increase its assessment on members from 1.38 m. (33c.) per ton to 1.80 m. (43c.). The other alternative is to decrease sales by about

4,000,000 tons a year.

The steel industry has protested against the proposal to advance domestic coal prices and the decision calling for higher wages. It is declared by the steel producers that higher coal prices would increase costs of rolled materials by about 2 m. (48c.) per ton and, in the present condition of keen competition, might result in suspension of operations by many steel plants. Should the wage decision not be enforced, a general coal strike is expected.

GERMAN STEEL OUTPUT HIGH

Production in Excess of Last Year—Prices Firm
—Steel Makers Seek Higher Tariff

BERLIN, GERMANY, April 20.—Production of both pig iron and steel continues large. In the first three months of the year output exceeded the large total of the corresponding period in 1927. In the first quarter of this year 3,473,436 metric tons of pig iron and 4,-212,940 tons of steel were produced, compared with 3,115,800 tons of pig iron and 3,958,227 tons of steel in the first quarter of 1927.

At the meetings of the Stahlwerksverband, the A-Products Syndicate (semi-finished and railroad materials) and the Steel Bar Syndicate, it was reported that specifications were coming out freely, but that the Railroads Corporation was still rather inactive in purchasing this year's requirements. The building trades are improving slowly, largely because of credit diffi-

culties.

Most mills are booked with sufficient business for the next two or three months and are seeking to increase their exports. Efforts to advance export prices, so as to reduce the present wide margin between the domestic and foreign quotations, have not been very successful. Business in steel bars for export has been active, and foreign demand for other products shows

considerable improvement.

The subject of tariff protection is being discussed by various industries and recently Doctor Reichert, secretary-general of the Iron and Steel Industries Association, stated that he strongly favored retention of the present duties. He described the present combination of tariff protection and cartels as the only means by which the German domestic market can be protected from foreign competition. There is opposition to protection in the metal-consuming industries, and "Avi," the association of these consumers, has made a declaration against the protective policy. It points out that, at best, a higher tariff could only slightly increase the domestic sales of iron and steel, including machinery, whereas it would result in a serious loss of export business through foreign reprisals. The association contends that the greater part of present export business in finished iron and steel products would be threatened. Throughout its report the association stands firmly for realization of the lower tariff resolutions of the Geneva conference of 1927. The same view is expressed by the association of consumers of sheets and tin plate.

There has been further discussion of the possibility

of establishing a syndicate to control the domestic thin sheet market. Several of the larger sheet mills, however, are opposed to such a move, and price concessions continue numerous. The Bandeisen Vereinigung (band syndicate) has established a study corporation, similar to the company created by the wire industry for experimental production.

A corporation has been formed for the purpose of resuming mining operations in the Saxon-Erzegebirge. These ore deposits cover about 100 sq. km., and recent prospecting indicates that a small section of the area contains about 7,000,000 tons of magnetic iron ore and a large quantity of zinc. It is planned to erect an elec-

tric smelting plant.

JAPANESE MARKET IMPROVING

Banking Problems Still Unsolved—Black Sheet Imports Larger—Semi-Finished Capacity Increased

GENERAL business conditions in Japan during March showed a distinct improvement over February, and April returns are expected to show further improvement, says the latest monthly report of A. Cameron & Co., importers, Kobe. The report calls attention to the growing dissatisfaction of labor and says that certain legislative reforms are absolutely necessary.

Referring to the financial situation, the report says: "The Minister of Finance is still grappling seriously with the bank situation, insisting that any closed bank which is to be merged with other banks must write off all bad and doubtful debts and therefore merge in a solvent state. It has been pointed out before that there is an opinion that there are far too many small banks, which are usually managed or controlled by inexperienced young men. The five chief banks have deposits exceeding the total amount of all other commercial banks together. Such commercial banks number 1276. At the close of 1927, all commercial banks had, according to official statistics, deposits of yen 5,461,000,000, of which the larger banks, to the number of 13, held yen 4,403,000,000, or about 80 per cent of the total of all clearing house banks."

Black Sheet Imports Increase

Imports of black sheets during February at Kobe, Osaka and Yokohama totaled 11,745 tons, a gain of 1800 tons over the previous month and an increase of 2672 tons over February, 1927. Arrivals by countries were as follows: Great Britain, 8350 tons; United States, 2446 tons; Germany, 878 tons; Belgium, 48 tons; all others, 23 tons. These shipments were mostly to speculators who had purchased late last year in anticipation of an increase in the tariff, which, however, did not materialize. Consequently, there is an excessive stock in the market, which is preventing any advance in price. Prices of light-gage black sheets during February were unchanged at 72 sen (34.06c.) per sheet for British material, 73 sen (35.50c.) for American and 701/2 to 71 sen (33.35c. to 33.59c.) for Kawasaki dockyard sheets. Consumption of sheets is fairly active and, as warmer weather approaches, inquiries from China are increasing, and it is expected that a good demand from China for galvanized sheets will stimulate the black sheet market.

Kawasaki Buys Mill Equipment

The Kawasaki Dockyard Co. is reported to have bought yen 800,000 (\$378,480) worth of machinery from Friedrich Krupp A. G., Essen, Germany, for rolling sheet bars. According to the report, the new machinery will produce 200,000 tons of bars annually, and the installation will be completed by November of this year. This additional capacity will bring the total for the works to 320,000 tons of sheet bars a year.

the works to 320,000 tons of sheet bars a year.

Statistics compiled by A. Cameron & Co. show a total Japanese capacity in black sheets of 253,000 tons, of which the Kawasaki Dockyard Co. has capacity for 200,000 tons of Nos. 20 to 30½ gage, the Osaka Teppan Seizo Kaisha, Ltd., Tokuyama, 42,000 tons of Nos. 16 to 30½ gage and the Nihon Kogyo Setetsu Kaisha, Yatsuya, 10,000 tons of Nos. 16 to 30½ gage. Of the total

capacity, Nos. 10 to 13 gage are estimated at 170,000 tons.

Output of tin plate by the Yawata Steel Works in February declined considerably, resulting in an improvement of the tin plate market in March. It seems to be the consensus of opinion that the demand for tin plate will steadily increase during the next few months and the market will be quite active. Tin plate prices have been about yen 12.80 (\$6.05) per 100-lb. base box for American material and yen 12 (\$5.68) per 100-lb. base box for British.

LOW PRICES ON COTTON TIES

Orders Taken Here at 12c. a Bundle Under Domestic Market—Japanese Rail Orders Go to Germany

NEW YORK, May 8.—Importers of European steel report an advance of about 50c. per ton in prices during the past week, so that Thomas grade steel bars are quoted at about 1.75c. per lb., base. There is a moderate demand for structural material, but most of the business being closed is in sales for prompt delivery from arriving steamer.

With the opening of the cotton tie market by American mills at \$1.25 per bundle, importers of German, Belgian and British cotton ties found that they had

been selling at an unnecessarily low level, most orders for imported ties having been closed at about \$1.13 per bundle, except for the British product, said to have been offered by the Barrow Hematite Steel Co., Ltd., which was about 7c. a bundle higher. Belgian ties sold at prices ranging from as low as \$1.05 to as high as \$1.10 per bundle. Importers estimate that 200,000 to 300,000 ties have been sold for delivery from Europe this season.

Far Eastern business continues rather inactive. Recent orders for rails placed by Japanese railroads have gone to European mills. Two miles of 100-lb. girder rails and one mile of 94-lb. grooved rails were awarded to a German export agency in Japan for execution by the Vereinigte Stahlwerke A.G., Düsseldorf, the leading German steel producer.

Japanese purchases of light-gage black sheets are still being made from British mills or the principal domestic maker, the Kawasaki Dockyard Co. The latest British quotation is understood to be about £14 18s. (\$72.57) per ton, c.i.f. Japan, and the price of the Kawasaki Dockyard Co. is equivalent to about \$73.25 per ton, c.i.f. Japanese port.

On a tonnage of 7 miles of 30-lb. rails inquired for by the South Manchuria Railway Co., the total German quotation per mile, including accessories, is understood to have been yen 3545 (\$1,677.14), which was yen 490 (\$231.82) per mile lower than the lowest American bid. The German bid per ton, including accessories, was \$33.11, c.i.f. Japanese port.

Production of Steel Ingots and Castings in 1927

THE compilations of production of steel ingots and castings for 1927 have been issued by the American Iron and Steel Institute and are covered in the accompanying tables.

The total output of ingots and castings showed a falling off of 6.95 per cent from 1926. The drop in ingots was 6.73 per cent and that in castings, 14.7 per cent.

The production of electric steel ingots and castings made a new record, being 666,087 tons, compared with the previous high in 1926 of 651,723. There was a decided jump in the output of electric steel ingots and a sharp drop in the output of electric steel castings, but the total, as stated, was a record. The tonnage of castings still remained the highest for any year, except the record of 1926, from which it showed a drop of 9.5

per cent. While there was an increase in the output of electric steel ingots over 1926, the record output of electric steel ingots was in 1918.

The falling off in the production of alloy castings and ingots was in ingots. The reduction was 8 per cent. In the case of castings alone, the production of 145,844 tons in 1927 was only 257 tons less than the output of 1926.

The production of duplex ingots and castings showed a sharp drop of nearly 22.5 per cent from the output of 1926. The figure of 1927 (2,184,674 tons), compares with 2,666,110 tons, the average of the preceding four years.

Production of Steel Ingots and Castings by Processes

	(pen-heart	1				Mis- cella- neous	Total
Years	Basic	Acid	Total	Bessemer	Cru- cible	Elec- trie		Gross Tons
1913			21,599,931	9,545,706				31,300,874
1914	16,271,129		17, 174, 684	6,220,846				23,513,030
1915			23,679,102	8,287,213				32, 151, 036
1916			31,415,427					42,773,680
1917			34, 148, 893					45,060,607
1918			34,459,391	9,376,236				44,462,432
1919	25,719,312	1,229,382	26,948,694	7,271,562	63,572	384,452	2,952	34,671,232
1920	31,375,723	1,296,172	32,671,895	8,883,087	72,265	502, 152	3,535	42, 132, 934
1921	15,082,564	507,238	15,589,802	4,015,938	7,613	169,499	945	19,783,797
1922	28, 387, 171	921,812	29,308,983	5,919,298		346,039		35,602,926
1923	34,665,021	1,234,636	35,899,657	8,484,088	44,079	515,872		44,943,690
1924	30,719,523	857,827	31,577,350	5,899,590	22,473	432,526		37,931,939
1925	37,087,342	947, 146	38,034,488	6,723,962	19,562	615,512		45, 393, 524
1926	39,653,315	1,038,664	40,691,979	6,934,568	15,493	651,723		48, 293, 76
1927	37, 144, 268	924,067	38,068,335	6, 191, 727	9,036	666,087		44,935,18

Production of Steel Ingots

1913	19,884,465	805, 250	20,689,715	9,465,200	103,655	20,973	587 30, 280, 130
1914	15,936,985			6, 154, 964			312 22,819,784
1915	21,975,622	968,148	22,943,770	8, 194, 737	99,026	46,348	331 31, 284, 212
916	29,011,146	1,227,832	30, 238, 978	10,916,248	120,341	126,048	302 41, 401, 917
1917				10,320,688			261 43, 619, 200
1918	31,970,691	1,347,870	33,318,561	9,215,392	113,782	403,068	219 43, 051, 022
1919	25,405,347	780,827	26, 186, 174	7, 172, 743	62,563	272,942	373 33,694,798
1920	30,926,393	759, 102	31,685,495			346,956	298 40, 881, 392
1921	14,864,607		15, 155, 357			84,404	317 19, 224, 084
1922	27,961,190	517,045	28,478,235			191,057	34,568,418
1923	34,093,711		34,747,048			279,914	43,485,66
1924	30,263,005		30,717,931			225,977	36,811,15
1925	36,632,060		37, 116, 903			335,978	44, 140, 73
1926	39, 172, 688		39,705,973			325,278	46,936,20
1927	36,750,387	493,653	37,244,040	6, 153, 703	7,696	371,278	43,776,71

Production of Steel Castings

1913	460, 161	450,055	910,216	80,506	17.571	9,207	3.244	1,020,744
1914	334,144	270, 173	604,317	65,882	11,186		3.310	693,246
1915	333,103	402,229	735,332	92,476	14,756	23,064	1,196	866,824
1916	605,512	570,937	1,176,449	142,791	9,351	42,870		1.371.762
1917	558,568	654,588	1,213,156	159,272	3,834			1,441,407
1918	505,880	634,950	1.140.830	160,844		108,296	110	1,411,410
1919	313,965	448,555	762,520	98,819		111,510		976, 437
1920	449.330	537,070	986,400	104,980		155, 196		1,251,542
1921	217,957	216,488	434,445	38,809	736	85,095	628	559,713
1922	425,981	404,767	830,748	47,733	1,045	154,982		1,034,508
1923	571.310	581, 299	1,152,609	67,512	1,952	235,958		1,458,031
1924	456,518	402,901	859,419	53,437	1,377	206,549		1, 120, 782
1925	455, 282	462,303	917,585	53,834	1,833	279,534		1,252,786
1926	480,627	505,379	986,006	43,066	2,041	326, 445		1,357,658
1927	393,881	430,414	824, 295	38,024	1,340	294,809		1,158,468

Production of Alloy Steel Ingots and Castings

	Castings	Ingota	Years	Total	Castings	Ingota	Years
809,548 1,673,496	40,255 59,104	769,293 1,614,392	1921 1922	646,953 1,021,147	69,846 97,896	577,107 923,251	1914 1915
2,106,489	92,220 85,948	2,014,269	1923	1,362,615	56,458	1,306,157	1916
2,432,973	112,583 146,101	2,320,390 2,317,313	1925 1926	1,787,852 1,481,188	66,485	1,721,367	1918 1919
	112,583	2,320,390					

Production of Alloy Steel Ingots and Castings by Processes, Gross Tons, 1927

Processes	Ingots	Castings	Total
Open-hearth steel—basic. Open-hearth steel—acid. Bessemer steel. Crueible steel. Electric steel.	1,716,296 53,320 63,430 3,189 284,360	26,470 49,281 10,664 272 59,157	1,742,766 102,601 74,094 3,461 343,517
TotalGross tons.	2,120,595	145,844	2,266,439

STEEL MOORING MAST

Sheathed in Sheet Steel and Equipped with Electric Elevator

THE United States Army Air Corps has constructed at Scott Field, nine miles from Belleville, Ill., a mooring tower for dirigibles which is the first one of



its kind in this country. It is made of sheet steel and an angle iron frame and is approximately 168 ft. high. At the base it is 18 ft. in diameter, but tapers within a short distance from the bottom to 11 ft. Near the top of the tower is an observation platform 25 ft. in diameter.

The tower is anchored to a concrete foundation by 24 anchor bolts. The top of the tower may sway 3 to 4 in., as when under wind pressure or the pull of the dirigible.

Within the tower Warner geared two-speed alternating current switch controlled elevator, manufactured and installed by the Warner Elevator Mfg. Co., Cincinnati. The elevator travels a distance of 134 ft. and has a capacity of 2000 lb. at 250 ft. per min. The elevator is used for numerous purposes, such as transporting repair parts and crews to dirigibles and carrying the light tender, who takes care of the obstacle lights on the tower. These

lights are placed approximately every 25 ft. on the four sides of the tower. For servicing the lights, the elevator cab has a special hinged door in the rear.

In a small frame building at the foot of the tower is a windlass from which a cable passes up through the center of the tower into a tubing leading to a metal cup. It is into the metal cup that the metal nose of the dirigible fits when it is moored.

Within a short time the new tower is to be tested and if it proves as satisfactory as anticipated, other towers will be built at various points throughout the country. The tower was fabricated and erected by the Pittsburgh-Des Moines Steel Co.

Aluminum Output Expanded in 1927 —Imports Declined

Washington, May 8.—Despite curtailed production of automobiles in 1927, the use of aluminum and high-strength aluminum alloys was large, particularly for pistons and reciprocating parts of automotive engines, according to a statement prepared by J. M. Hill, United States Bureau of Mines, who places the value of new aluminum produced in the United States last year at \$39,266,000, an increase of 4 per cent as compared with 1926. The principal producing plant is at Massena, N. Y., where approximately half of the metal made in the United States was recovered. Other works are at Niagara Falls, N. Y.; Alcoa, Tenn., and Badin (Whitey), N. C. Control dams on the Yadkin and Little Tennessee rivers in North Carolina were completed, thus assuring continuous power for the Badin and Alcoa plants of the Aluminum Co. of America.

Use of aluminum for collapsible tubes for pastes, greases, etc., according to the statement, is relatively new but growing. More aluminum is being used in other lines, such as in the manufacture of furniture, airplanes, railroad and street cars, and motor buses.

Imports of aluminum metal, scrap and alloys in 1927 were 4 per cent less in quantity than in 1926.

They amounted to 72,188,518 lb. in metal, scrap and alloys; 400,322 lb. in plates, sheets, bars, etc., and 142,453 lb. in hollow ware.

Exports of aluminum ingots, scrap and alloys in 1927 increased 501 per cent in quantity over 1926, amounting to 3,535,085 lb. as against 586,749 lb.; exports of plates, sheets, bars, strips and rods increased 56 per cent to 10,997,475 lb., compared with 7,047,422 lb.; exports of tubes, moldings, castings and other shapes decreased 28 per cent to 1,529,615 lb. as against 2,115,274 lb. in 1926.

Coal and Coke Production in April

Output of bituminous coal in April is estimated by the United States Bureau of Mines at 32,200,000 net tons. This is a sharp reduction from the March output of 43,955,000 tons, and is below the figure of April, 1927, at 34,674,000 tons. Anthracite production, on the other hand, at 6,940,000 tons in April, showed a marked increase over the March output of 5,497,000 tons. It was, however, below that of April, 1927, which was 7,127,000 tons.

Beehive coke production has fallen to a very low figure. The April output is placed at 337,000 tons, against 449,000 tons in March. In April, 1927, it was 779,000 tons. It should be noted that April, 1928, had one working day less than April, 1927, and about two days less than March, 1928.

Investments Abroad Promote Exports

(Concluded from page 1309)

raw materials is certain to grow, and similar increases may reasonably be expected in the expenditures of our tourists and foreign residents and in immigrant remittances.

Balancing Exports and Imports

We arrive, therefore, at this analysis: Our export trade must be encouraged and increased in every practical way up to the point where we do not invite reprisals from our foreign competitors in both our domestic and our logical export markets, at excessively low prices, based on their starvation wages. We must consider, in many lines, our higher costs, despite the counterbalance of greater efficiency through expert methods and mass production.

On the other hand, if there occurs any serious diminution in the export of American investment capital, we must continue more largely to import, to whatever extent may be necessary, articles of luxury, raw materials and other necessities for our American industry, to the end that the aggregate may counterbalance our increased exports of merchandise. Irrespective of the problematical ultimate payment of all the war debts and adjustment of reparations, we must continue for some time generously to loan our surplus investment funds abroad, in order to complete the resuscitation of Europe and expansion of industry alike for our competitors and customers there, that their prosperity may increase, and that Europe in turn may resume its investments in the consuming countries to the same extent as before the war. This combined investment of the surplus wealth of the major countries can only produce an ever increasing exchange of exports to and imports from the minor nations, whose assets will continue to expand and whose earnings will provide the means to pay the interest on their liabilities.

Mining and industrial electric locomotives shipped in the first quarter of 1928 numbered 188, valued at \$843,-011, according to the Department of Commerce. This value was the lowest in two years, and the number was less than the 173, valued at \$866,106, shipped in the last quarter of 1927. In the first quarter of 1927 shipments included 283 units, valued at \$1,372,225.

FABRICATED STRUCTURAL STEEL

Awards of 24,700 Tons-25,200 Tons in New Work

 $F_{\rm cated}$ structural awards reported during the last seven days amounted to slightly less than 24,700 tons. Of this total, 3000 tons was for a bridge for the Missouri Pacific Railroad and 9000 tons for miscellaneous jobs in New York. New projects amounted to 25,200 tons, the largest being a court house at Denver, Colo., which will require 3600 tons. Awards follow:

Boston, 200 tons, Thompson Spa building, to Palmer Steel Co. East Boston, 250 tons, theater, to A. L. Smith Iron Works. FALL RIVER, MASS., 475 tons, office building, to Providence Steel & Iron Co.

LEOMINSTER, Mass., 150 tons, theater, to Eastern Bridge & Structural Co.

PAWTUCKET, R. I., 250 tons, power house for Blackstone Valley Gas & Electric Co., to New England Structural Co.

New York, 10,500 tons, reported to the Structural Steel Board of Trade; 9000 tons in the following awards not previously reported: Storage warehouse on White Plains Avenue, subway station on Myrtle Avenue, Brooklyn, Cox Bakery in Jamaica and Eleto warehouse at Thirty-eighth Street and First Avenue, to McClintic-Marshall Co.; column cores for building at 305 East Forty-sixth Street, warehouse for New York Dock Co. at Furman and Joralemon Streets, Brooklyn, and Film Center building Ninth Avenue, Forty-fourth and Forty-fifth Streets, to Levering & Garrigues Co.; garage and service station at Hempstead, L. I., to Lehigh Structural Steel Co.; recreation building for Temple Emanu-El at Port Richmond, S. I., to Eidlitz & Ross; Explorers' Club at 544 Cathedral Parkway, Flatbush Boys' Club at 2241 Bedford Avenue, Brooklyn, and Tilden Theater at Flatbush and Tilden Avenues, Brooklyn, to Hedden Iron Construction Co.; 10-story loft building at 149th Street and Park Avenue, commercial building at 241st Street and Broadway, 15-story loft building at 253 West Twenty-seventh Street, gymnasium for Hebrew Orphan Asylum at 138th Street and Amsterdam Avenue and Queensborough Library, Jamaica, to Harris Structural Steel Co.

New York, 475 tons, apartment building at 417 East Fiftyfirst Street, to Easton Structural Steel Co.

ALBANY, N. Y., 1000 tons, eight scows for New York Division Canals and Waterways, to Midland Barge Co., Midland, Pa.

ELMIRA, N. Y., 590 tons including 120-ton junior beams, Mark Twain Hotel, to Jones & Laughlin Steel Corporation.

PHILADELPHIA, 200 tons, bridge arch centers; awarded by Vare Construction Co., to Belmont Iron Works.

Reading Railroad, 175 tons, bridge, to Shoemaker Bridge Co. WILMINGTON, DEL., 850 tons, North Market Street bridge, to Phoenix Bridge Co.

PITTSBURGH, 1000 tons, Allegheny Steam Heating Co. unit, to Jones & Laughlin Steel Corporation.

PITTSBURGH, 465 tons, Irene Kaufmann Settlement House extension, to American Bridge Co.

DAYTON, OHIO, 150 tons, Y. M. C. A. building, to Massillon Bridge & Structural Co.

DEFIANCE, OHIO, 100 tons, high school, to Massillon Bridge & Structural Co.

CINCINNATI, 260 tons, St. Gregory's Seminary, to L. Schreiber & Sons Co.

MEMPHIS, TENN., 625 tons, five sand barges for Mississippi River Commission, to American Bridge Co.

BIRMINGHAM, 1800 tons, car underframes for St. Louis-San Francisco Railway, to Virginia Bridge & Iron Co.

BIRMINGHAM, 110 tons, garage at Ensley for Hyatt Phillips Auto Co., to Ingalls Iron Works Co.

FLOMATON, ALA., 120 tons, plant for Roquemore Gravel Co., to Ingalls Iron Works Co.

MONTGOMERY, ALA., 150 tons, McGough garage, to Ingalis Iron Works Co.

DETROIT, 175 tons, building for American Brass Co., to Pittsburgh Bridge Co.

CHICAGO, 700 tons, Temple Sholem, to A. Bolter's Sons, local; previously reported to the Midland Structural Steel Co.

CHICAGO, 250 tons, building for the Link-Belt Co., to Mississippi Valley Structural Steel Co.

CHICAGO, 650 tons, approach to Crawford Avenue bridge, to unnamed bidder.

CHICAGO, 500 tons, two apartment buildings, to Duffin Iron Co., local.

LITTLE ROCK, ARK., 3000 tons, bridge for Missouri Pacific Railroad, to American Bridge Co.

SACRAMENTO, CAL., 950 tons, bridge over San Joaquin River at Herndon, to United States Steel Products Co.

OAKLAND, CAL., 380 tons, warehouse for Port Commission, to California Steel Co.

SAN FRANCISCO, 110 tons, apartment at Fillmore and Washington Streets, to Golden Gate Iron Works.

APPLETREE, WASH., 155 tons, motor sheds for Great Northern Railway, to Hoflus Steel & Equipment Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

STATE OF NEW HAMPSHIRE, 200 tons, highway bridges. BOSTON, 1500 tons, Charles H. Tenney Co. office building. BIDDEFORD, ME., 800 tons, Boston & Maine railroad bridge. LOWELL, MASS., 700 tons, Boston & Maine railroad bridge. HOLYOKE, Mass., 400 tons, Boston & Maine railroad bridge. Bristol, N. H., 140 tons, bridge.

PIEDMONT, N. Y., 500 tons, Standard Trap Rock Co. plant.

New York Central Railroad, 2000 tons, bridges. State of New York, 200 tons, bridges for State Highway

Commission; bids May 12.

Newark, N. J., 400 tons, manufacturing building; Walter Kidde & Co., engineers.

Philadelphia, 2000 tons, Y. M. C. A. building.

Chesapeake & Ohio Railway, 300 tons, bridges.

Mansfield, Ohio, 400 tons, Farmers National Bank building. Dayron, Ohio, 725 tons, four hangars at Wright flying field.

BIG FOUR RAILROAD, 260 tons, bridges. MICHIGAN CENTRAL RAILHOAD, 450 tons, bridges. FLINT, MICH., 500 tons, store building for Kresge Co

STATE OF MICHIGAN, 200 tons, bridge work for State Highway Department.

SOUTH BEND, IND., 1000 tons, New York Central station. CHICAGO, 5000 tons, reconstruction of Fine Arts Building; previously reported as 2000 tons.

GLENVIEW, ILL., 2500 tons, race track grandstand. PORTAGE, WIS., 160 tons, Dewitt Street bridge; bids May 15.

MILWAUKEE, 300 tons, new Kinnickinnic River span at Lincoln Avenue; bids May 15.

ST. Louis, 1000 tons, building for Swift & Co.

Memphis, Tenn., 250 tons, two snag barges for United States Engineering Corps; Dravo Contracting Co., low

HASTINGS, NEB., 400 tons, Masonic Temple.

Denver, Colo., 3600 tons, court house.

ASTORIA, ORE., 1500 tons, pulp plant; bids at once.

KETTLE FALLS, WASH., 1125 tons, bridge over Columbia River; J. H. Tillman, Santa Cruz, Cal., low bidder on general contract.

CHERRY, WASH., 200 tons, school; bids being taken

Seattle, 800 to 1000 tons, West Waterway bridge; bids soon.

Los Angeles, 250 tons, apartment at Kenmore & Wilshire

Boulevards; bids being taken.

San Francisco, 125 tons, office building at Pine and Leisdorrf

Streets; bids in.
OAKLAND, CAL., 140 tons, office building at Fourteenth and
Webster Streets; bids in.

Oakland, Cal., 160 tons, hotel at Seventeenth and Jefferson Streets; bids being taken.

Screw Machine Products Association Meets Next Week

A general meeting of the screw machine products association will be held Thursday, May 17, at the Great Northern Hotel, Chicago. Dr. Arthur E. Swanson, consulting economic engineer, will speak on "some dangers in the present business situation." Malcolm Baird is field secretary of the association.

The Director of Supplies, United States Shipping Board Emergency Fleet Corporation, will receive bids up to May 21 for the sale of steel rails, switches, frogs, etc., of the railroad tracks at Hog Island, Pa. The rails include approximately the following tonnages: 6353 gross tons of 85-lb., 261 tons of 67½-lb. and small lots of 60 lb., 30 lb. and guard rails.

A tow of six barges loaded with pig iron is now en route from the furnaces of the Sheffield Steel & Iron Corporation, Sheffield, Ala., via the Tennessee and Ohio Rivers. This is said to be the largest tow of pig iron ever moved on these rivers. The pig iron will be loaded on cars at Joffa, Brookport and Metropolis, and transported by rail to melters in the St. Louis and Chicago territories.

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This Issue in Brief

Supplant the craze for volume with a reasonable passion for profits, urges editor. Unreasoning drive for the last 20 per cent of business is an important contributing cause for shrinking earnings. Many manufacturers seem to prefer full operation with red ink than part operation with black.—Page 1320.

Stove plant takes a leaf from automotive industry's experience and adopts mass production methods with noteworthy success. All manufacturing departments form one complete manufacturing unit, to provide for a straight-line flow.—Page 1310.

New joint of great strength, and gas tight, is formed by painting steel parts with powdered copper and heating in hydrogen atmosphere. The copper melts and penetrates deeply into the steel. Destruction tests frequently reveal that the individual iron crystals will be pulled apart while the junction of copper and iron holds.—Page 1305.

Business upswing will continue until a high point is reached in spring of 1929, A. T. Simonds predicts. Business is now, he says, in the seventh major movement since the war, an upward movement that started in the fall of 1927.—Page 1308.

You will stabilize your business and free yourself from the bogey of the business cycle by finding a way to appraise ultimate consumer demand, says General Motors official. With that fundamental factor determined, it is not difficult to coordinate it with production, purchases and employment of capital.—Page 1322.

Saves time by dumping slag directly into cars in slag pockets under open-hearth furnaces. Cars are of steel plate, brick lined. They are mounted on rollers, and are pulled out by means of a steel cable.—Page 1320.

Wage reductions may be precipitated if price of sheets and strips is further beaten down, says head of producers' association. Wage cuts might have a tremendous influence on other industries, he declares, and might decrease purchasing power all over the country.—Page 1323.

New high record in steel output. April daily rate of ingot production was 172,103 tons, which was 2.5 per cent above the previous high rate of 167,973 tons, established in March, 1927. —Page 1329.

If we want a growing export business, we must continue to buy more from abroad, says E. P. Thomas. Europe must sell to us if she is to have money to buy from us. If imports are not adequate the difference may be balanced by liberal foreign loans, but, of course, these have their limits.—Page 1309.

Foundry avoids crushing coke by using a special clam shell bucket. When making up a cupola charge the bucket is let down into coke bin, is filled automatically and automatically closed when the bucket is lifted.

—Page 1315.

Deep bath produces better steel, open-hearth man declares. Though a shallow bath is quicker, the deep bath has less surface area to the ton of contents for oxidation by the flame, and cleans up the lime better.—Page 1317.

Business trend follows the movement of money rates, says manufacturer. Lowering cost of credit stimulates manufacture and construction, improving business in general. Raising the cost of credit has the opposite effect.—Page 1308.

Many manufacturers who could benefit by adopting budgetary control are afraid of it because they believe it implies rigidity, says General Motors executive. This is a totally wrong conception, for flexibility is a prime requisite. There must be a quick response when changing conditions necessitate adjustment.—Page 1322.

Cooling cenveyor for castings is 645 ft. long. It consists of an endless chain and a monorail. Stove castings are suspended from small trolleys. The conveyor runs up to a point above the roof and then down to the sand blast, the circuit taking 105 min.—Page 1314.

Qver-capacity competition is causing depletion of our resources of metal ores. Production is being pushed as if resources were boundless and as if realization must be hurried. Prices crumble under competition and the marginal producers ought to quit.—Page 1338.

Steel buyers are increasing their demands for quality—at a low price. Steel is no longer just "steel." Producers need to raise the number of classifications as to quality, which will require increasing cooperation between sales department and the mill.—Page 1339.

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Over-Capacity Competition

In almost every old industry in the United States there is an excess of producing capacity and also an excess of personnel. The desire to use as much as is possible of both develops keen competition and contraction, even extinguishment, of margin and profit. The economic theory is that this condition should reduce prices to the level of the marginal producer and should lead to the survival of the fittest only. The difference between theory and practice pertains to what is the cost of production and the margin of profit.

This is the most difficult determination in the case of production out of natural resources, especially the minerals, that are wasting assets. The producers of petroleum, copper, lead and zinc are particularly confused by this problem. In principle iron and coal are in the same position, but owing to the greater extent of the known resources of both there is less immediate concern about them.

We may point out also, as we have done heretofore, a difference as regards petroleum, in that it is a migratory substance and our American land system compels land owners to be hasty in getting of it what they can, having no assurance that, like the ores, it will remain stationary where nature put it.

The development of the natural resources of the non-ferrous metals is seldom very far ahead; i. e., broadly thinking. The porphyry copper mines as a group can probably maintain their present rate of production for 50 to 60 years; but the rest of the world's copper is derived from mines that are hardly to be expected to live for more than 20 years. The lead and zinc mines that are now producing are on the whole even less assured. Nevertheless production is pushed as if their resources were boundless and as if realization must be hurried. Prices crumble under competition and the marginal producers ought to quit; but generally they do not know that they are marginal producers until they have become insolvent.

Once an enterprise has been capitalized it must generally be kept going, and the law of the survival of the fittest may be very slow in its operation. The economic corrective is delayed until such time as there is no inducement to adventurers to invest in the class of enterprise that has become unprofitable. Adversity thus operates rather through the check to new capitalization than through curtailment of immediate production.

Of course, it is not necessary to rush metal production and *ipso facto* impair profits. The copper producers have learned this, and without any collusion among themselves the major interests in that metal deem it wisest to gage production according to market requirements at a reasonable price, figuring that it is better business to sell 80 or 90 pounds at a moderate profit than 100 pounds at no profit at all. Their intelligence and temperance put them in a sound industrial position; on the other hand, the great medley of the zinc industry is in bad. It is in petroleum, however, that the ravages of a rush to squander natural resources is to be seen at the worst.

Welded Steel-Gains and Losses

HIS growing vogue of welding is causing mixed ▲ feelings in the iron and steel industry. Foundrymen may view with concern the supplanting of a sizable quantity of gray iron or large steel castings with built up pieces made of rolled steel; at the same time sellers of the latter product may hail it for bringing them a new outlet. Drop forgers may worry when a forged brake lever is redesigned into a piece of tubing and two end fittings, but the makers of seamless tubes of all sorts regard the rise of the art of welding as a leading factor in the later expansion of their business. Sheet steel has been used in much additional tonnage for automobile bodies and parts, tankage, furniture and architectural details solely because the welded joint has made it adaptable for those purposes. (Nor has the end been reached yet. Elsewhere in this issue is described a new method of automatic welding which is calculated to extend further the field of stampings and screw machine parts.)

It is a case of gains offsetting losses; for welding has enabled steel to invade fields formerly

held exclusively by other materials of construction, notably wood. Testimony to the same effect was given at the American Welding Society's meeting, just past—that it would help regain some of that large market lost to reinforced concrete.

Before an audience containing many engineers and fabricators, G. A. Caldwell, vice-president Mississippi Valley Structural Steel Co., said that welded structural steel was enabling his company to compete far more successfully with reinforced concrete in that intermediate zone where the advantages of the two systems overlap. He believes that welding, especially when specialized automatic machinery shall have been developed, will so lower the costs of shop fabrication that this midway zone will be pushed over considerably toward the concrete side, with a corresponding improvement in the economic position of those structural shops which specialize in medium heavy buildings.

This development would be gratifying to many branches of the steel trade, though it may bring regret to those who now make and sell steel reinforcement. But here again the net result would be an expansion in steel consumption, since a welded steel structure, even though it may contain somewhat less metal than a riveted equivalent, still uses many times as much steel as the concrete reinforcement in a substitute building.

Quality and Price in Steel

REQUENTLY steel makers are disposed to complain of customers who, after crowding for the lowest price by the last dollar or even fifty cents per ton, thereupon proceed to make exacting demands as to quality, demands which the producer is disposed to feel place the steel quite in a class by itself. With the passage of time such complaints seem to grow more numerous rather than less.

These controversies, if they may be called such, as to quality are not by the march of events destined to die out. Rather the natural tendency is for them to increase unless something specific and definite is done about it, and indeed a great many things. For consider that in the old days nearly all the steel made was simply "steel" and once made it passed as well into one line of consumption as another. Year by year steel has been growing more specialized. With new conditions new problems are presented and new practices must be adopted.

The buyer, having agreed to pay certain money, naturally wants to secure all he can for that money. He has an advantage, unfortunate for the seller, in that he deals successively with two distinct parties. First he makes his bargain with the salesman and later he has dealings with the mill, as to quality, tolerances, rejections, etc. The desideratum is to increase cooperation between the sales department and the mill.

The steel industry needs to increase the number of its classifications as to quality, not at this one time or at another, but continuously, for improvement, specialization or adaptation is growing continually. The procedure by which the seller is placed at a disadvantage is insidious. Users of steel are in competition and are trying to succeed just as hard as are other people. Little by little they change their practices, subjecting the steel to harder and harder usage.

Reflection shows that standardization may be in some respects a hindrance rather than a help in this matter. It is easy to be deluded by standards, which may seem to define much more than they do. It is simple to call one steel "deep drawing" and another steel "extra deep drawing," for instance, but these are practically mill standards, the buyer seeking to get all he can from the first class, to avoid buying the second.

The various standards in steel quality are set up according to processes. An extra process involves an extra price, but with the same process costs differ according to the assiduity of the buyer. These variations require that the mill and sales department work closer and closer together, for competition between producers does not end with the sales department. The whole transaction is to be considered in the light of satisfaction to the customer. The seller has not really bested his competitor if he secures a slightly higher price but in the end delivers a considerably better quality.

Teapot Dome By-Products

S the exposure of the oil scandal has become A practically complete we may now try to summarize it, at least the Teapot Dome part of it, in a way that is different from that of the cartoonists, the paragraphers and the politicians. That stern sleuth-hound, Senator Walsh, thought he was following the scent of a political stink-pot, and was regaining for the American people a valuable natural resource. He scented something, to be sure, but it turned out to be a sordid commercial affair, quite unpolitical, and it is a wonder that the senatorial committee continued to think of it as any of its business. Nevertheless it must be said that, even if Senator Walsh failed to make capital for his political party, or to render a real service to the American people, he did indeed work well for those of them who are stockholders in the Sinclair Consolidated Oil Co.

H. F. Sinclair believed the Teapot Dome to have oil sands that would be productive and profitable and secured a lease of it through Secretary Fall. He transferred this lease to the Mammoth Oil Co. that he organized; then he sold an interest in that company to the Sinclair Consolidated Oil Co. for 250,000 shares of the common stock of the Sinclair company and an arrangement whereby it was to build at Portsmouth, N. H., certain tankage required by the terms of the lease from the Government. Mr. Sinclair was then the chairman of the board of the Sinclair company. At the time of this transaction its common shares were selling in the thirties, so that the value of 250,000 of them ran well into the millions.

The Sinclair company was also led to build, through a subsidiary, a pipe line to Wyoming that cost about 27 million dollars.

The Teapot Dome turned out to be less productive than was expected; and up to the time when Senator Walsh stepped in the stock of the Mammoth Oil Co. looked like a bad investment for the Sinclair company. However, its pipe line proved useful for the conveyance of other Wyoming oil.

The United States Supreme Court decided that the lease made by Secretary Fall to Mr. Sinclair was fraudulent and cancelled it. This had nothing to do with the considerations that the terms of the lease were fair to the Government and better than the conventional; or to the prospect that the oil of the dome might be drained off by others, leaving the Government with only the shell. It does not look like the Government regaining an asset of immense value that had been stolen from it. It looks more like the Government losing its royalty oil, but perhaps getting \$1,340,000 worth of steel tankage at Portsmouth at the expense of the Sinclair stockholders, who have been, of course, quite innocent. However, the lease was fraudulent and was consequently cancelled, and that was that.

So this has naturally raised the question in the Sinclair board how it stands after having given up 250,000 of its common shares and built more than a million dollars' worth of tankage in a Government navy yard in consideration of property rights that the Supreme Court has said the vendor did not own. Conversations on the matter between the board and the other parties are going on.

The Continental bond issue that has so much exercised the senators was quite a different affair. They had an idea that it was the cloak for a political corruption fund of first-class magnitude, but it proved to be merely a shield under which certain oil magnates bought a large quantity of crude petroleum and immediately resold it to their own companies at a profit. Their trips to regions remote from Washington and their refusals to answer questions were quite explainable. The truth as to this was deduced by business men long before the senators became aware of it. When finally the disclosure was made, two of these magnates turned their shares into the Sinclair Crude Oil Purchasing Co., which is jointly owned by Sinclair Consolidated and Standard Oil of Indiana.

Sinclair Consolidated is a very big and very successful company, whose shares are widely distributed among the public. Thanks to Senator Walsh it has obtained restitution of a lot of cash, and perhaps it may come to enjoy some other adjustments.

Changes in the Finished Steel Line-Up

S OME interesting changes occurred in the distribution of steel last year among the different finished products, but they were not large. Changes in the forms of steel have not been so great in recent years as they used to be. There appears to be less occasion than formerly for the steel company making diversified products to maintain a substantial excess of steel finishing over steel making capacity.

The statistics of last year's production, given elsewhere in this issue of THE IRON AGE, show that from 1926 rails, bars and plates had the larger decreases while shapes, tubular goods and tin plate had the smaller decreases. This is not in line with the attitude of some of the trades during the year, for pipe was regarded as having a decidedly off year and tin plate a very substantial decline. Yet while production of rails decreased 12.8 per cent, of plates 11.4 per cent and of bars 11.0 per cent, tubular goods lost only 4.7 per cent and tin plate only 6.1 per cent.

Department of Commerce statistics showed an increase in fabricated structural steel lettings of 6.0 per cent, from 2,890,800 net tons in 1926 to

3,063,500 net tons in 1927. According to the figures of Railway Age the number of freight cars built in the United States and Canada decreased 27.9 per cent, from 93,278 in 1926 to 67,328 in 1927. These are important consuming lines for shapes and plates and now we find that shape production decreased 4.3 per cent while plate production decreased 11.4 per cent.

It is rather surprising to find that the total production of tubular goods decreased only 4.7 per cent, when there was so much talk of dullness. Welded decreased 8.4 per cent, while seamless increased 11.5 per cent. Welded lost 290,064 tons but seamless gained 88,811 tons. Of the total loss in welded nearly one-third was to seamless, which is likely to make further gain in view of the number of seamless mills recently built or now building.

Wire rod production actually made a gain, though of less than 1 per cent, and in face of the fact that wire nail production decreased by 3.2 per cent. By the long range comparison, however, rod production was light last year, as there were six better years.

As the strip industry has been growing rapidly it is interesting to observe how sheets and strips fared. Sheets, not including black plates for tinning, decreased 6.9 per cent while hot rolled strips increased 7.9 per cent. The two combined lost 3.8 per cent. A portion of the sheet loss was to strips, but not a large proportion.

Pig Iron at Over 1000 Tons a Day

B LAST furnaces producing more than 1000 tons of pig iron a day are getting into the news columns of The Iron Age. Not so long ago such an accomplishment was regarded as an iridescent dream. Large outputs, even at the rate of 700 tons a day, had been looked upon as possible only by the use of large scrap charges. But both in the United States and in Germany over 1100 tons has been produced from normal charges of ore, limestone and coke, scrap percentages being small. One American furnace has recently made close to 30,000 tons in a 31-day month, with outputs of single days running from 1075 to nearly 1200 tons. A German furnace is reported to have produced 1150 tons in one day.

Two important factors are represented in these records: the use of larger volumes of air and improved methods of charging. Furnaces into which formerly 50,000 cubic feet of air per minute was blown are now taking up to 75,000 to 80,000 cubic feet. In charging, coarse ore is being segregated from fine and introduced separately, thus minimizing channeling. These changes as well as an increase in the size of the hearths are revolutionizing furnace outputs.

With the capacity of older furnaces increased by the use of larger hearths and augmented blowing equipment, and with new stacks built on expansive lines, greater production with still fewer furnaces may be looked for. This has been the steady trend of the American industry in quite recent years. However, it will take time to determine whether the 1000-ton furnace can be considered as other than extraordinary—the exception that proves the rule.

CORRESPONDENCE

Non-Ferrous Alloys and Their Names

To the Editor: It is the opinion of the writer that attempts to name nickel silver by such a designation as coppernick, as suggested in your editorial of April 5, or a similar abbreviated form should be discouraged.

Fundamentally so-called nickel silver is nothing more nor less than a yellow brass to which nickel has It would appear that the name "nickel been added. brass" would be most informative to the trade at large and would be in keeping with the present-day practice of eliminating brand and proprietary names in designating engineering materials. By the use of the term nickel brass, the prefix giving the percentage is usually recognized as the percentage of the special alloy added to the brass, i.e., "15 per cent nickel brass" indicates at a glance that it is a nickel-bearing copper-zinc alloy containing 15 per cent of nickel.

P. E. McKinney.

Superintendent forge and foundry division, United States Naval Gun Factory, Washington.

To the Editor: Your thought of applying the general scheme of the Society of Automotive Engineers numbering system for steels to the non-ferrous alloys is a reasonable one. However, before this could be done, standard and better recognized non-ferrous compositions should be promulgated by some specification-writing body. The combinations that can be made of the various elements entering into commercial alloys are This leads to an unnecessary and, moreover, infinite. a costly and uneconomic procedure when applied to both the purchase of non-ferrous materials and their use in Several years ago the American Society the foundry. for Testing Materials published a list of approximately 1500 different non-ferrous compositions known to the This large number of alloys is a product of inventive genius, a desire for novelty, both from the sales promotion and patent protection standpoints, but is not necessarily an economic necessity. The facility of manufacture and physical and other properties of the alloy should be the determining factors.

Referring to the Society of Automotive Engineers specifications for non-ferrous alloys (which, incidentally, are not numbered in accordance with their system for steels), one finds 13 alloys covering brass and bronze compositions. This seems rather reasonable. Of course, considerable work has been done by this society and other specification-writing bodies to narrow down the compositions of non-ferrous alloys, but considerably more work can be done with the aim of greater standardization. A simple, comprehensive numbering system would be a further incentive to specify

and use standard compositions.

In the non-ferrous products there is a general ten-dency to add a little more of this or a little less of that element when trouble is experienced, either in the foundry or machine shops, with the hope that the unknown reason for the trouble will be eliminated. It is a very easy thing to increase or decrease the zinc 2 per cent in a red brass. It will still be a red brass, and, if the difficulties experienced with the previous mixture vanish, we have then another composition to swear by or swear at, depending on what the future holds forth. An example of this is the old standard gun metal formula, 88-10-2, and its step-child, 88-8-4.

The red brass composition of 85-5-5 is almost a standard, with the exception that the producer of ingots is called upon to supply numerous varieties of it dif-

fering only a little in composition.

Referring particularly to the nickel-copper and nickel-copper-zinc series, there is a large variety of compositions. I believe that the rolled nickel-silver compositions are fairly well standardized, basing the various compositions on nickel content. On the other hand, the varieties of cast alloys are extensive. perusal of the patents issued covering cast nickel-silver compositions gives one occasion to wonder whether the patenting of an alloy has any value whatsoever. The compositions overlap and even are similar for various

patents for all practical applications.

In conclusion, I will say that an effort on the part of specification-writing bodies to establish a limited number of compositions for the various alloy series and to number them in a logical, orderly manner, similar to the S.A.E. steel nomenclature, would be most desirable. The use of these standard alloys, identified in such a manner, would eventually make for a great saving in the operations of both consumers and producers.

W. F. GRAHAM.

Technical division, Ohio Brass Co., Mansfield, Ohio.

Service—A Protest

To the Editor: You hear a lot nowadays about ser-The term is probably as much abused as any expression we have, and the fault may quite generally be laid at the door of those organizations that in a desperate effort to embellish the advantages of ownership of a product stress the point that with ownership there accrues an obligation out of all proportion to the product itself.

True service, as it should apply to merchandising, should be a guarantee of satisfaction in the stipulated performance of the product, and should not, in its appeal, be directed along the lines of least resistance to an extent that the customer expects an everlasting attendance to the details of operation. Whether an organization sells sewing machines, tractors, automobiles or electric light and power, an overemphasis on the service that may be expected from the day of purchase or installation until every complex human desire is satisfied can only arouse suspicion as to the basic merits of the product or the organization behind the product.

True service consists in the maintaining of certain standards of value. To exaggerate those values with promises of unreasonable after-sales service has an inevitable reaction of dissatisfaction in the public

consciousness.

HUGO E. JUNG.

Kerman, Cal.

Veeder-Root Directorate Selected

Incident to the organization of Veeder-Root, Inc., Hartford, Conn., which is being formed as a merger of the Veeder Mfg. Co., Hartford, and the Root Co., Bristol, Conn., as a manufacturer of calculating machines and kindred equipment, the following directors have been chosen: John T. Chidsey, recently president and treasurer Root Co., who will be president of the new company; Graham H. Anthony, formerly vice-president and secretary Allen Mfg. Co., Hartford, who will be vice-president in charge of manufacturing for the new organization; Ralph C. Coxhead, who has been president Ralph C. Coxhead Corporation, New York, and will be vice-president in charge of sales for Veeder-Root, Inc.; Curtis H. Veeder, recently president Veeder Mfg. Co.; David J. Post, who has been treasurer Veeder Mfg. Co.; Fuller F. Barnes, president of the Wallace Barnes Co., the Associated Spring Corporation and Barnes-Gibson-Raymond, Inc., and formerly vice-president Root Co.; Frederick S. Chase, president of the Chase Cos., Inc., Waterbury, Conn.; Henry H. Conland, publisher of the Hartford Courant; Charles B. Cook, vice-president Royal Typewriter Co., Brooks Leavitt, a member of Paine, Webber & Co., New York investment bankers; V. Russell Leavitt, manager of the Hartford office of Paine, Webber & Co.; Charles D. Rice, factory manager of the Underwood-Elliott Fisher Co.; Charles T. Treadway, chairman of the Bristol National Bank and the American Trust Co., and Frank E. Wolcott, president Frank E. Wolcott Mfg. Co. Another director will be elected.

"Spray Coating-its Hazards and Safeguards" is the title of a booklet recently issued by the Hartford Accident & Indemnity Co., Hartford, Conn., which contains the results of a comprehensive investigation into the health and property hazards connected with the use of spray lacquers.

April Iron Output Gains Moderately

Actual Data Show That Daily Rate Gained 2968 Tons or 2.9 Per Cent Over March—Net Loss of Two Furnaces

ACTUAL data of the April production of pig iron, reported by practically all companies, show that the estimates, made by the companies a week ago and published last week, were very close to the real output. The April production was 106,183 tons per day, according to the final returns, or only 153 tons more than the estimate of 106,030 tons published a week

Total April coke pig iron output was 3,185,504 gross tons or 106,183 tons per day for the 30 days, as compared with 3,199,674 tons, or 103,215 tons per day, for the 31 days in March. This is a gain for April of 2968 tons, or 2.88 per cent. This compares with a gain in March of 3.2 per cent over February. The April production last year was 3,422,226 tons, or 114,074 tons per day—a gain of about 7.4 per cent over April this year. Production last month was the smallest for that month since 1922, which was also true of January, February and March. It was, however, the largest thus far this year.

Production for the first four months of this year has

been 12,155,065 tons, as compared with 12,950,087 tons for the same four months in 1927.

Net Loss of Two Furnaces

Eight furnaces were shut down and six were blown in during April—a net loss of two. Three of the furnaces blown in were Steel Corporation stacks and two were independent steel company furnaces. One merchant stack was lighted. Of the furnaces blown out three were merchant, three were independent steel company stacks, and two belong to the Steel Corporation. Thus there was no gain or loss in steel making furnaces, the net loss for the month being merchant stacks.

Possibly Active Furnaces Reduced

Two of the Lackawanna furnaces of the Bethlehem Steel Corporation at Lackawanna, N. Y., have been abandoned and will soon be dismantled. The Lebanon furnace of the Lavino Furnace Co. in the Lebanon Valley has also been dismantled and the Princess stack

Daily rate of Pig Iron Product Steel Work April, 1927	rks Merchant* Iron Total
May 84,486 June 78,110	
July 69,778 August 71,418 September 69,677 October 66,999 November 64,600 December 64,111	23,660 95,073 22,825 92,498 22,819 89,810 23,679 88,279
January, 1928 69,52 February 78,44 March 83,48 April 85,18	$\begin{array}{cccccccccccccccccccccccccccccccccccc$

^{*}Includes pig iron made for the market by steel companies

Pig Iron Pro	duction by	Districts.	Gross Tor	18
	April	March	Feb. (29 days)	Jan.
New York and Mass Lehigh Valley Schuylkill Valley Lower Susq. and	81,140 60,062	216,224 80,058 51,325		
Lebanon Valleys Pittsburgh district Shenango Valley Western Penna	31,522 663,784 100,073 116,405	33,301 $639,693$ $101,946$ $101,365$	29,387 597,543 90,179 86,725	30,338 582,497 77.023 89,372
Maryland, Virginia and Kentucky Wheeling district Mahoning Valley	102,678 115,284 319,227	$\begin{array}{c} 103,857 \\ 133,764 \\ 296,491 \end{array}$	89,803 118,108 261,837	$\begin{array}{c} 94,590 \\ 108,188 \\ 247,371 \end{array}$
Central and North- ern Ohio	336,200 25,548 693,271	$330,176 \\ 25,729 \\ 715,439$	294,427 24,773 639,763	313,697 32,480 608,771
Wis., Colo, and Utah	. 134,163 199,487	139,101 223,314 7,891	207,108	224,132
Total	. 3,185,504	3,199,674	2,900,126	2,869,761

Daily Avera	ge Produ by Month	ction of C s Since Ja	oke Pig 1 n. 1, 1924-	ron in the	united
		1925	1926	1927	1928
Jan. Feb. Mar. Apr. May June	97,384 106,026 111,809 107,781 84,358 67,541	108,720 114,791 114,975 108,632 94,542 89,115	106,974 104,408 111,032 115,004 112,304 107,844	100,123 105,024 112,366 114,074 109,385 102,988	92,57 100,00 103,21 106,18
1/2 year	95,794	105,039	109,660	107,351	
July Aug Sept	57,577 60,875 68,442	85,936 87,241 90,873	103,978 103,241 104,543	95,199 95,073 92,498	
Oct	79,907 83,656	97,528 $100,767$	107,553 $107,890$	89,810 88,279	
Dec.	95,539	104,853	99,712	86,960	
Year	85.075	99,735	107,043	99,266	

Cal	be E	2/2022/1	000 1	122 1	Blast

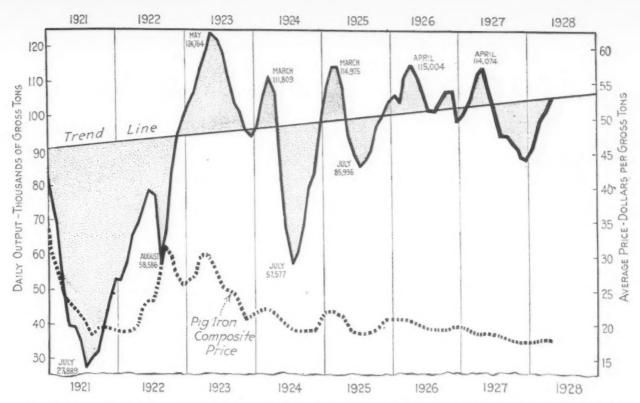
	\	lay 1	-Ap	ril 1
Furnaces New York:	Number in Blast	Capacity	Number in Blast	Capacity
Buffalo Other N. Y. and Mas	. 12 s 3	5,695 1,155	12	5,720 1,230
New Jersey	. 0		0	
Pennsylvania:				
Lehigh Valley Schuylkill Valley Susquehanna Valley Ferro, and Spiegel	. 2	2,600* 1,600 980 240	5 5 2	2,600* 1,820 1,015 60
Lebanon Valley			0	****
Ferromanganese . Pittsburgh District . Ferro. and Spiege	. 35	21,500 490	35 2	21,560 350
Shenango Valley Western Pennsylvan Ferromanganese	ia 7	3,550 3,500 220	6 6 2	3,290 2,900 430
Maryland		2,520 3,670	6 7	3,045 4,315
Ohio:				
Mahoning Valley Central and Norther Southern	n 18	10,410 10,700 850	17 18 3	10,000 10,300 830
Illinois and Indiana Mich., Wis. and Minn. Colo., Mo. and Utah	. 6	22,440 2,565 1,710	35 6 4	23,070 2,745 1,745
The South:				
Virginia Kentucky Alabama Ferromanganese Tennesssee	16	220 370 6,600 95 335	1 17 1 2	215 380 7,140 70 250
Total	195	104,015	197	104,650

^{*}Includes spiegeleisen.

Production								by	Months,
	B	eginni	ng Je	zn. 1.	192	6-Gros	s Tons		

1926	1927	1928
Jan. 3,316,201 Feb. 2,923,415 Mar. 3,441,986 Apr. 3,450,122 May 3,481,428 June 3,235,309	$\begin{matrix} 3,103,820\\ 2,940,679\\ 3,483,362\\ 3,422,226\\ 3,390,940\\ 3,089,651 \end{matrix}$	2,869,761 2,900,126 3,199,674 3,185,504
1/2 year 19,848,461	19,430,678	
July 3,223,338 Aug 3,200,479	2,951,160 $2,947,276$	
Sept 3,136,293 Oct 3,334,132	2,774,949 2,784,112	
Nov	2,648,376 2,695,755	
Year* 39,070,470	36,232,306	*****

^{*}These totals do not include charcoal pig iron. The 1926 production of this iron was 163,880 tons.



Daily Pig Iron Output in April Was 2.9 Per Cent More Than in March; Composite Price Decreases Slightly Inclined line represents the gradually increasing theoretical needs of the country, and shows that production is now substantially normal. Dotted line represents The Iron Age composite price

of the Princess Iron Corporation at Glen Wilton, Va., which was recently sold at public auction, will not be operated again. This reduces the number of possibly active furnaces in the United States from 347 to 343.

Capacity Active on May 1

The operating rate of the 195 furnaces active on May 1 is estimated at 104,015 tons per day, as compared with an operating rate of 104,650 tons per day for the 197 furnaces on April 1.

Manganese Alloy Output

Production of ferromanganese in April was 18,405 tons, or the smallest this year. Two companies made spiegeleisen in April, but the data cannot be made public.

Furnaces Blown in and Out

During April the following furnaces were blown in: one Carrie and one Clairton furnace of the Carnegie Steel Co. in the Pittsburgh district; the Claire furnace in the Shenango Valley; one Cambria furnace of the Bethlehem Steel Corporation in western Pennsylvania; one Haselton furnace of the Republic Iron & Steel Co. in the Mahoning Valley, and one Gary furnace of the Illinois Steel Co. in the Chicago district.

Furnaces blown out or banked during April were as follows: The Brooke furnace in the Schuylkill Valley; one Edgar Thomson furnace of the Carnegie Steel Co. in the Pittsburgh district; the Colonial furnace in western Pennsylvania; one Sparrows Point furnace of the Bethlehem Steel Corporation in Maryland; one La Belle furnace of the Wheeling Steel Corporation in the Wheeling district; one Gary furnace of the Illinois Steel Co. and one Indiana Harbor furnace of the Youngstown Sheet & Tube Co. in the Chicago district, and one Woodward furnace of the Woodward Iron Co. in Alabama.

American Management Association to Hold Conference

The 1928 production executives' conference of the American Management Association will be held at the Hotel Statler, Buffalo, June 6, 7 and 8. Group bonuses will be the subject at the morning session on the first days, the principal speakers being Walter N. Polakov, consulting engineer, New York; R. F. Whisler, head of rate and time study department, National Cash Register Co., Dayton, Ohio, and Brooks Shepard, secretary Eberhard Mfg. Co., Cleveland. At the luncheon meeting on that day Ernest G. Draper, treasurer Hills Prothers Co. New York will discuss unemployment.

Brothers Co., New York, will discuss unemployment. A further discussion of bonuses will occupy the next two sessions of the meeting, while the remainder of the conference will be given over to the subject of apprentice and other employee training methods. Among the speakers on this subject will be A. B. Gates, assistant manager of industrial relations for the Commonwealth Edison Co., Chicago; Dr. J. A. Randall, president Rochester Mechanics Institute, Rochester, N. Y.; Russell N. Keppel, personnel manager Standard Oil Co. of New Jersey, Bayonne, N. J.; George F. Kent, manager of industrial relations for the Bucyrus-Erie Co., South Milwaukee, and E. W. Kempton, educational director American Steel & Wire Co.

	el Compan al Iron and Ferro		Own Us Spiegelei Ferroma 927———	sen and nganese	
1927	1928	Fe-Mn			Spiegel
Jan 2,343,881	2,155,133	31,844	7,486	22,298	Ť
Feb 2,256,651	2,274,880	24,560	7.045	19,320	Ť
Mar 2,675,417	2,588,158	27,834	7,650	27,912	Ť
Apr 2,637,919	2,555,500	24,735	12,907	18,405	Ť
May 2,619,078		28,734	9,788		
June 2,343,409	******	29,232	10,535	- + + +	
1/2 year.14,876,355		166,939	55,411		
July 2,163,101		26,394	9,350		
Aug 2,213,815		21,279	9.104	* * * *	
Sept 2,090,200		20,675	6.037		
Oct 2,076,722		17,710	6,129		
Nov 1,938,043		17,851	6,521	* * * *	* * * *
Dec 1,987,652	******	20,992	6,816		
Year 27,345,888		291,840	99,368	****	****

^{*}Includes output of merchant furnaces. †Data not available for publication.

Iron and Steel Markets

Record Four-Month Steel Output

Daily Rate Reaches New Peak in April—Steel Bookings Show Slight Recession—Sheets Weaker—Price Reductions in Pig Iron

STEEL ingot production in the first third of the year, as forecast by THE IRON AGE last week, established a new four-month record. Output so far in May has shown surprisingly little recession. Chicago mills remain on a 95 per cent basis, and average operations in the Greater Pittsburgh district, despite a decline at Youngstown, are holding at 80 per cent.

Mill bookings, including specifications against contracts, are not materially smaller than for the first third of April. In fact, at Cleveland, plates, shapes and bars are moving in somewhat better volume.

Aside from further weakness in some finishes of sheets and reductions in basic pig iron in eastern Pennsylvania and foundry iron at Birmingham, prices have shown little change.

The nearest approach to the ingot output of 16,846,729 tons in the first four months of this year was a production of 16,521,904 tons in February, March, April and May of 1927. The high operations of the industry in the first third of 1928 may owe something to the price advances that began late in December, although there is little evidence of accumulated stocks in buyers' hands save in a few isolated lines like wire nails. On the contrary, Pittsburgh reports instances of pressure by buyers for prompt deliveries, indicating an underestimating of requirements.

The large four-month output is testimony to the volume of steel going into widely ramifying uses and suggests that evidence furnished by the staple barometers of steel consumption is less conclusive than formerly.

Building activity was fully in keeping with steel production, but automobile output, although virtually equal to that of the first third of last year, fell considerably short of the totals for the corresponding periods in 1926 and 1924.

Depression in the oil fields has been reflected in subnormal purchases of steel, and railroad equipment buying has been in meager volume. Rail bookings during the entire winter buying movement, which began late last fall, showed a gain of possibly 10 per cent over commitments a year previous.

There was a similar gain in purchases by the farm implement industry, which, however, is one of the minor consuming lines, taking a relatively small percentage of the total production of finished steel.

Steel ingot output in April exceeded expectations. While mill operations tapered toward the end of the month, production, at 4,302,573 tons, was the fourth highest monthly total, and the daily average, at 172,103 tons, established a new record.

Estimates that ingot production this month will fall 5 per cent from the rate for April would still make the output for May with its two extra working days in excess of 4,400,000 tons.

The slower pace of steel buying is being met with the contention among makers that price reductions will not develop business and that stabilization of both volume and price will be the record of the next few weeks.

Further weakness, however, has occurred in certain products. Black sheets are more generally available at 2.70c., Pittsburgh, a decline of \$1 a ton. On galvanized sheets, prices as low as 3.55c. and 3.50c., Pittsburgh, have appeared, compared with a recent minimum of 3.60c. Invasion of the Chicago district by more easterly mills has adversely affected Western sheet production and has resulted in concessions from the Chicago price of 2c. on plates, shapes and bars, particularly in outlying territories.

Prices on cotton ties announced for 1928 take a different form in that they are on a quantity basis. On mill shipments in carloads the price is \$1.27 per 45-lb. bundle, f.o.b. Atlantic or Gulf ports; in lots of 2000 bundles, \$1.25, and in larger lots, \$1.23. Last year's prices were \$1.20 at Atlantic ports and \$1.21 at Gulf ports.

While rail mill operations continue at a high rate, one large road has canceled its May quota of rails and another has failed to exercise an option on 100,000 tons in addition to its winter purchase of 200,000 tons.

Structural steel awards, at about 25,000 tons, were below the average of recent weeks, but considerable business is pending. At Chicago about 100,000 tons, including 50,000 tons for the Mercantile Mart, is in prospect for early action.

A reduction of 50c. a ton on Southern foundry iron and a like decline on basic pig iron in eastern Pennsylvania, where two steel companies have purchased a total of about 30,000 tons, reflect the growing competition for business. Cleveland iron, moved by boat to Chicago, is being offered for prompt shipment at \$18 dock, or 50c. a ton below the quotations of Chicago merchant furnaces. An effect of the competition of English low phosphorus iron at Great Lakes ports, where it is being offered at \$26, duty paid, is a reduction of 50c. a ton on this grade of iron at Valley furnace.

Both of the THE IRON AGE composite prices have dropped this week, that for pig iron reaching a new low point for the year at \$17.50 a ton, compared with a previous low of \$17.54 early in January. The finished steel composite has declined to 2.348c. a lb., but is still 1½ per cent above the year's low, in January, of 2.314c.

A Comparison of Prices .

Advances Over the Previous Week in Heavy Type, Declines in Italics At Date, One Week, One Month, and One Year Previous

i.									
Pig Iron, Per Gross Ton:	May 8, . 1928	May 1, 2 1928	Apr. 10, 1 1928	day 10, 1927	Sheets, Nails and Wire,			Apr. 10,	
No. 2 fdy., Philadelphia	\$20.76	\$20.76	\$20.76	\$21.76	Per Lb. to Large Buyers:	1928 Cents	1928 Cents	1928 Cents	Cents
No. 2, Valley furnace		17.25	17.25	18.50	Sheets, black, No. 24, P'gh	2.70	2.75	2.80	2.80
No. 2, Southern, Cin'ti		19.69	19.69	21.69	Sheets, black, No. 24, Chi-			0.00	-10
No. 2. Birmingham		16.00	16.00	18.00	cago dist. mill	2.85	2.85	3.00	3.10
No. 2 foundry, Chicago*		18.50	18.50	20.00	Sheets, galv. No. 24, P'gh.	3.60	3.60	3.65	3.65
Basic, del'd eastern Pa	19.00	19.50	19.50	20.75	Sheets, galv. No. 24, Chi- cago dist. mill	2.20	2 70	9 05	9 0 =
Basic, Valley furnace	16.50	16.50	17.00	18.50	Sheets, blue, 9 & 10, P'gh.	3.70	$\frac{3.70}{2.00}$	3.85	3.95
Valley Bessemer, del'd P'gh	19.26	19.26	19.26	21.26	Sheets, blue, 9 & 10, Chi-	2.00	2.00	w. 10	40 - 40 55
Malleable, Chicago*		18.50	18.50	20.00	cago dist. mill	2.15	2.15	2.20	2.35
Malleable, Valley		17.25	17.25	18.50	Wire nails, Pittsburgh	2.55	2.55	2.65	2.50
Gray forge, Pittsburgh		18.51	18.51	19.76	Wire nails, Chicago dist.	0.00	0.50		
L. S. charcoal, Chicago		27.04	27.04	27.04	mill Pittsburgh	2.70	2.70	2.70	2.60
Ferromanganese, furnace	100.00	100.00	100.00	95.00	Plain wire, Chicago dist.	2.50	2.50	2.50	2.40
					mill	2.55	2.55	2.55	2.45
Rails, Billets, Etc., Per Gro	oss Ton				Barbed wire, galv., P'gh	3.35	3.35	3.35	3.25
Oh. rails, heavy, at mill	\$43.00	\$43.00	\$43.00	\$43.00	Barbed wire, galv., Chicago				
Light rails at mill	36.00	36.00	36.00	36.00	dist. mill	3.40	3.40	3.40	3.30
Bess. billets, Pittsburgh	33.00	33.00	33.00	33.00	Tin plate, 100 lb. box, P'gh	\$5.25	\$5.25	\$5.25	\$5.50
Oh. billets, Pittsburgh	33.00	33.00	33.00	33.00	Old Material				
Oh. sheet bars, P'gh	34.00	34.00	34.00	34.00	Old Material, Per Gross Ton				
Forging billets, P'gh	38.00	38.00	38.00	39.00	Heavy melting steel, P'gh.		\$15.25	\$15.50	\$15.50
Oh. billets, Phila	38.30	38.30	38.30	39.30	Heavy melting steel, Phila.		13.50 13.00	13.50 12.50	14.00 12.25
Wire rods, Pittsburgh	44.00	44.00	44.00	42.00	Heavy melting steel, Ch'go Carwheels, Chicago		13.50	13.50	14.25
	Cents	Cents	Cents	Cents	Carwheels, Philadelphia		15.50	15.50	16.00
Skelp, grvd. steel, P'gh, lb.	1.85	1.85	1.85	1.90	No. 1 cast, Pittsburgh		14.50	14.50	15.75
America Britain Second a Bust 10.	2100	2100	2	2.00	No. 1 cast, Philadelphia	16.00	16.00	16.00	17.00
Finished Iron and Steel,					No. 1 cast, Ch'go (net ton)		14.00	14.00	16.00
	0	C		Conto	No. 1 RR. wrot. Phila		15.00	15.00	16.50
Per Lb. to Large Buyers:		Cents	Cents	Cents	No. 1 RR. wrot. Ch'go (net)	11.50	11.50	11.00	11.50
Iron bars, Philadelphia	2.12	2.12	2.12	2.12	Coke, Connellsville, Per No	A 273			
Iron bars, Chicago	2.00	2.00	2.00	2.00				\$2.60	\$3.00
Steel bars, Pittsburgh	1.85 2.00	1.85	1.85	1.85 2.00	Furnace coke, prompt Foundry coke, prompt		\$2.60 3.75	3.75	4.00
Steel bars, Chicago	2.19	2.00	2.00	2.19	Foundry coke, prompt	12, 8 15	0.10	0.10	4.00
Steel bars, New York	1.85	2.19		1.85	M-4-le				
Tank plates, Pittsburgh		1.85 2.00	1.85 2.00	2.00	Metals,				
Tank plates, Chicago Tank plates, New York					Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
				1.80	Lake copper, New York		14.25	14.30	13.12 %
Beams, Pittsburgh		1.85 2.00	1.85 2.00	2.00	Electrolytic copper, refinery		14.00	14.12 %	
Beams, Chicago					Zinc, St. Louis		5.85	5.75	6.15
Beams, New York			2.20	2.14	Zinc, New York	6.30	6.20	6.10	6.50
Steel hoops, Pittsburgh	2.20	2.20	5.20	4,09	Lead, St. Louis		6.00	6.00	6.40
Mile anamaga amitahina	shauma da	ton Jolia		Coundator	Lead, New York		6.10	6.10	6.75
*The average switching of			very to	roundries	Tin (Straits), New York	11.05	10.50		68.00
in the Chicago district is 61c	ber to	11.			Antimony (Asiatic), N. Y.	1 1 . 49 13	10.00	0.02.75	2 80.10

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Steel Demand Steady, But Buyers Are More Insistent on Quick Deliveries

PITTSBURGH, May 8.—Demand for steel products still is remarkable for persistency rather than volume. Seemingly, consumption is holding up well in most directions. Besides a fairly steady flow of specifications on old orders, new business is not materially behind that of the first week or 10 days of last month. Some indication of underestimating of requirements still is seen in the insistence of buyers for prompt deliveries, and cases are fairly numerous where the best promise of delivery won the order.

Scheduling of mills still is at short range, but as yet no great difficulty has been experienced in filling them. The trend of ingot production is down, but against some slipping in the Youngstown district, there is virtually full production in the Wheeling district. In the Pittsburgh district the rate is not below 80 per cent, which is a fair estimate of the combined areas of the Greater Pittsburgh district.

Prices still show irregularity, and in the case of sheets and the wider strips they are weak. Viewed as a general proposition, the market reflects merely the anxiety there always is on the part of some steel mills for orders when buyers are conservative, as they usually are at this time of the year, when sales rather than production problems are uppermost.

Jobbers are heavily stocked with wire nails as a

result of unusually large shipments against orders placed last December and for first quarter at prices well under those now quoted. A mill that might want to sell now would in many instances find jobbers thinking in terms of the cost of present stocks and unwilling to add to them at any higher price. It is this condition that has brought out quotations of less than \$2.65, base, per keg, Pittsburgh, which most makers still regard as the market.

There is no life to the pig iron market, which is becoming nominal as to prices in the absence of the test of large inquiries. Activity in scrap is on the part of dealers rather than the mills. The coal and coke market is in the doldrums.

Pig Iron.-The market is dull to the point of stagnation, with sales few and only occasionally of more than a carload lot. Prices are where they were a week ago, but are being supported solely by carload sales. Valley basic iron seems to have steadied at \$16.50, but doubt exists that this price can be done except in the immediate vicinity of the furnaces, as the most recent sales have demonstrated that \$16 is all that could possibly be obtained on business in competitive territory either toward Pittsburgh or north of the Valleys. The Central Alloy Steel Corporation reports that it did not sell the iron recently purchased by the American Steel Foundries at Alliance, Ohio. Since it is well established that the iron is moving from Canton to Alliance, the assumption is that it was some owned by middlemen. Carload lots of Bessemer iron are moving at the full quotation, which represents a differential of \$1 a ton over basic iron, as against 50c. recently. Low phosphorus iron is offered at \$26.50, Valley furnace, a drop of 50c. a ton.

Prices per gross	t	01	it,		f.	0	. 1	b,		Ţ	-	E.	L	E	ij		Ġ2	1	21	d	C	e	9 8	
Basic																								.\$16.50
Bessemer									۵			٠	. 0						0					. 17.50
Gray forge																								
No. 2 foundry																							6	. 17.25
No. 3 foundry																								
Malleable																								
Low phosphor	us	Š,	4	00	Ţ	Ţ	96	E		1	r	e	0					,				,	,	. 26.50

Freight rate to the Pittsburgh or Cleveland district, \$1.76.

Ferroalloys.—Regular users of spiegeleisen have quite generally signed contracts covering their requirements over the last half of the year, paying the same prices as on first half commitments. There has not been enough of a recession in steel ingot production to affect seriously the specifications for the commonly used ferroalloys. No attempt yet is being made to negotiate last half contracts for ferromanganese, and most consumers of high content ferrosilicon are covered for the entire year.

Bars, Plates and Shapes .- Rolling of these products are maintained by releases against contracts and a generous sprinkling of new orders, but order books are becoming slimmer, and a little more anxiety for business on the part of the mills is seen in the fact that spot sales are more frequent at the contract price of 1.85c. base, Pittsburgh, and there is a willingness to accept that price on small lots on which 1.90c. recently would have been asked. Plate makers are encouraged by the inquiries of the Erie Railroad for 1000 box cars and the Virginian Railway for 1000 50-ton hopper cars; also by the fact that there continues to be a good demand for river barges and towboats. Fabricated steel business is lighter than it has been and inquiries are fewer. Demand for bars is declining, since makers of cold-finished bars are taking fewer, and the orders for bolts and nuts have fallen off about 10 per cent from the recent peak. Reinforcing bar prices are irregular and on the worthwhile jobs price competition is rather sharp.

Wire Products.—Makers here still insist that the market on wire nails is \$2.65, base, per keg, Pittsburgh, and report specifications against second quarter contract carrying that price. Specifications reflect the fact that jobbers stocked up pretty heavily during the early part of the year, and the movement into consumption not having been in keeping, they still have sizable inventories. First quarter contracts having been completed last month, some makers seem to need orders and have offered concessions amounting to as much as 10c. per keg, but mills still holding to \$2.65 say that lower prices are concessions rather than outright reductions. The market is undergoing a test which should determine whether the price of \$2.65 is to stand or fall. Plain wire is moving well.

Semi-Finished Steel.—There is still a fairly heavy movement of billets, slabs and sheet bars on contracts, but an almost complete dearth of open market activity. Mills here and in Youngstown still are quoting \$33 for large billets and slabs and \$34 for sheet bars and small billets and slabs. Forging quality billets still are held at \$5 a ton higher than ordinary billets. A few specifications are being received against second quarter wire rod contracts carrying a price of \$44, base, Pittsburgh. The movement is not yet heavy, as a good many consumers still have lower-priced stocks upon which to draw.

Cotton Ties.—Prices have been announced for the 1928 season and take somewhat different form than those of the past few years in that they are placed upon a quantity basis. Prices are the same whether delivered at Atlantic or Gulf ports. On mill shipments in car lots the price is \$1.27 per bundle of 45 lb., in lots of 2000 bundles, \$1.25, and in larger lots, \$1.23. Last year the price was \$1.20, f.o.b. Atlantic ports, and \$1.21, f.o.b. Gulf ports, and the year before \$1.20, f.o.b. Gulf ports, and \$1.22, f.o.b. Atlantic ports. Quoting cotton ties f.o.b. port, came into vogue in 1924, partly in recognition of the abolition of Pittsburgh as a sole price basing point on steel, and partly to conform to quotations on imported ties. Previously, prices were quoted f.o.b. Pittsburgh.

Tubular Goods.—Movement of building and construction pipe still is satisfactory, but no improvement in the demand for oil country goods can be chronicled. It begins to look as if inquiries for the gas pipe line to run from Monroe, La., to Memphis and St. Louis may soon reach the mills, as the same interests are behind that project as sponsored the Amarillo-Denver line, which now is nearing completion.

Sheets.-The market is generally weak on the common finishes, but particularly so on galvanized sheets, which are not hard to get at 3.60c., base, and in some instances have been sold at that price subject to a commission of \$2 a ton to the jobber, or 3.50c. net to maker. Observance of No. 28 as the lightest gage of galvanized sheets to be rolled for roofing and siding is on the part of the few rather than the many. It seems that in the South and Southwest, where the demand is heaviest for these purposes, price rather than service has the strongest appeal and, to meet the situation, material running 72 to 73 lb. per square is being produced, as against 77 lb., the weight of a square of No. 28 gage steel. Generally, 3.65c. measures the top of the market, although some companies have not formally abandoned 3.75c. On black sheets 2.75c., base, is regarded as the minimum, although lower prices are reported. Blue annealed sheets commonly are 2c., base. New demands are light. Automobile body sheets still are moving well and at maintained prices.

Tin Plate.—Mill operations continue at substantially full physical capacity, as specifications on contracts are large. Unseasonable weather has probably caused some delay in putting in packing crops, but does not appear to have hurt the prospects for orchard fruits and there is a fair degree of optimism as to this year's

THE IRON AGE Composite Prices

Finished Steel May 8, 1928, 2.348c. a Lb.

One	week	ago.								 							2.355c.
																	2.362c.
One	year	ago.															2.353c.
10-y	ear pr	re-wa	r	3	W	r	a	g	e			į,					1.689c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and black sheets. These products constitute 87 per cent of the United States output of finished steel.

	High		Lov	V
1928	2.364c.,	Feb. 14;	2.314c.,	Jan. 3
1927	2.453c.,	Jan. 4;	2.293c.,	Oct. 25
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	Apr. 24;	2.446c.,	Jan. 2

Pig Iron May 8, 1928, \$17.50 a Gross Ton

One w	eek	ago		-			+						*		*	×				*	\$17.59
One m	onth	ag	0.							,		*			ė.	*		× 1	 		17.67
One ye	ar a	tgo.				0								e					 		 19.13
10-year	c br	.6-M	ar	a	V	ė	r	ag	çe.	×		*					×	8	 		 15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High	n	Lov	V
1928	\$17.75,	Feb. 14;	\$17.50,	May 8
1927	19.71,	Jan. 4;	17.54,	Nov. 1
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	Mar. 20;	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars	Woven Wire Fence Base to Retailers Per Net Ton	Track Equipment
Soft Steel Base Per Lb.	F.o.b. Pittsburgh\$65.00	Base Per 100 Lb. Spikes, % in. and larger \$2.80
b. Chicago	F.o.b. Cleveland	Spikes, ½ in. and smaller
'd Philadelphia	F.o.b. Chicago district mills	Tie plates, steel 2.18
'd New York2.19c. to 2.24c. 'd Cleveland2.04c. to 2.09c.	F.o.b. Birmingham 68.00	Angle bars
b. Cleveland	Sheets	Track bolts, to jobbers, all sizes, per 100 count
b. Birmingham	Blue Annealed	
f. Pacific ports2.35c. b. San Francisco mills2.35c. to 2.40c.	Nos. 9 and 10, f.o.b. P'gh2.00c. to 2.10c.	Welded Pipe
Billet Steel Reinforcing b. Pittsburgh mills1.95c. to 2.00c.	Nos. 9 and 10, f.o.b. Chicago dist. mill,	Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills
.h. Birmingham2.05c. to 2.15c.	Nos. 9 and 10, del'd Cleveland2.09c. to 2.19c.	Butt Weld
Rail Steel	Nos. 9 and 10, del'd Philadelphia. 2.32c. to 2.52c. Nos. 9 and 10, f.o.b. Birmingham. 2.25c. to 2.30c.	Steel Iron
.b. Chicago Heights mill1.85c.	Box Annealed, One Pass Cold Rolled	Inches Black Galv. Inches Black Galv. 45 19 1/4 to 1/4 to 1/4 11 +38
Iron mmon iron, f.o.b. Chicago2.00e.	No. 24, f.o.b. Pittsburgh2.75c. to 2.90c. No. 24, f.o.b. Chicago dist. mill2.85c. to 3.00c.	1/4 to 3/8 51 25 1/2 1/2 22 2
fined iron, f.o.b. P'gh mills2.75c.	No. 24, del'd Cleveland2.84c. to 2.94c.	1/2 56 42½ ¾ 28 11 34 60 48½ 1 to 1½ 30 18
mmon iron, del'd Philadelphia2.12c. mmon iron, del'd New York2.14c.	No. 24, del'd Philadelphia3.07c. to 3.22c. No. 24, f.o.b. Birmingham3.05c.	1 to 3 62 50 1/2
Tank Plates	Metal Furniture Sheets	Lap Weld
Base Per Lb.	No. 24, f.o.b. Pittsburgh, A grade 3.90c. to 4.00c. No. 24, f.o.b. Pittsburgh, B grade 3.70c. to 3.80c.	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
b. Pittsburgh mills1.85c. to 1.90c. b. Chicago2.00c.	Galvanized	7 and 8 56 43½ 3 to 6 28 18 9 and 10 54 41½ 7 to 12 26 11
b. Birmingham	No. 24, f.o.b. Pittsburgh3.60c. to 3.65c. No. 24, f.o.b. Chicago dist, mill3.70c. to 3.85c.	11 and 12. 53 40 1/2
'd Philadelphia	No. 24, f.o.b. Chicago dist. mill3.70c. to 3.85c. No. 24, del'd Cleveland3.64c. to 3.84c.	Butt Weld, extra strong, plain ends
b. Coatesville2.00c. to 2.05c.b. Sparrows Point2.00c.	No. 24, del'd Philadelphia3.92c. to 4.07c. No. 24, f.o.b. Birmingham3.90c.	1/4 41 24 1/4 to 3/4+19 +54 1/4 to 3/8 47 80 1/2 1/2 21 17
.b. Lackawanna	Tin Mill Black Plate	14 58 42 4 34 28 12
f. Pacific ports2.30c.	No. 28, f.o.b. Pittsburgh2.90c. to 3.00c. No. 28, f.o.b. Chicago dist. mill3.10c.	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
Structural Shapes	Automobile Body Sheets	2 to 3 61 501/2
.b. Pittsburgh mills	No. 20, f.o.b. Pittsburgh4.00c.	Lap Weld, extra strong, plain ends 2 58 421/4 2 23 9
.b. Chicago	Long Ternes No. 24, 8-lb. coating, f.o.b. mill primes4.10c.	21/2 to 4 57 461/2 21/2 to 4 29 15
b.b. Birmingham		4½ to 6 56 45½ 4½ to 6 28 14 7 to 8 52 89½ 7 to 8 21 7
b.b. Bethlehem	Tin Plate	9 and 10. 45 32 9 to 12 16 2
el'd Philadelphia	Per Base Box Standard cokes, f.o.b. P'gh district mills\$5.25	On carloads the above discounts on steel pir
l'd New York2.14½c. to 2.19½c. i.f. Pacific ports2.35c.	Standard cokes, f.o.b. Gary 5.35	are increased on black by one point, with supplementary discount of 5%, and on galvanized b
ot-Rolled Flats (Hoops, Bands and	Terne Plate	14 points, with supplementary discount of 5%
Strips)	(F.o.b. Morgantown or Pittsburgh)	On iron pipe, both black and galvanized, the above discounts are increased to jobbers by or
Base Per Lb. arrower than 3 in., P'gh2.20c. to 2.40c.	(Per package, 20 x 28 in.) 8-D coating I C \$11.20 (25-lb coating I C \$16.70	point with supplementary discounts of 5 ar 21/2%.
ider than 3 in. to 6 in., P'gh2.05c. to 2.10c. in. and wider, P'gh	8-fb. coating I.C.\$11.20 25-fb. coating I.C.\$16.70 15-fb. coating I.C. 14.00 30-fb. coating I.C. 17.75 20-fb. coating I.C. 15.30 40-fb. coating I.C. 19.85	Note.—Chicago district mills have a base two
arrower than 3 in., Chicago2.30c. to 2.40c. rom 3 to 6 in., Chicago2.10c. to 2.20c.		delivered base is 2½ points less. Freight
in. and wider. Chicago 2.00c. to 2.10c.	Alloy Steel Bars	points less than the above discounts. Chica delivered base is 2½ points less. Freight figured from Pittsburgh, Lorain, Ohlo, and Ch cago district mills, the billing being from the
otton ties, f.o.b. Atlantic and Gulf ports: Carlots per 45-lb. bundle\$1.27	(F.o.b. maker's mill.) S.A.E.	point producing the lowest price to destination
2000 bundle lots	Series Numbers Per 100 Lb.	Boiler Tubes
*Mills follow plate or sheet prices according	2000 (4% Nickel)\$2.90	Base Discounts, f.o.b. Pittsburgh
gage on wider than 12 in.	2100 (14% Nickel) 8.20 2300 (34% Nickel) 4.15	Lap Welded Steel Charcoal Iron
Cold-Finished Steel	2500 (5% Nickel)	2 to 2½ in 27 1½ in+18 2½ to 2½ in 37 1½ to 1½ in+8
rs, f.o.b. Pittsburgh mills2.20c.	3200 Nickel Chromium 3.65	2½ to 2¾ in 37 1¾ to 1¼ in + 8 3 in 40 2 to 2¼ in 2 3¼ to 3¾ in 42½ 2½ to 3 in 7 4 to 13 in 46 3¼ to 4½ in 9
rs, f.o.b. Chicago 2.20c. rs, Cleveland 2.25c.	3400 Nickel Chromium 5.85	4 to 13 in 46 31/4 to 41/2 in— 9
arting, ground, f.o.b. mill 2.45c. to 2.90c.	4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	Beyond the above discounts, 7 fives extra a given on lap welded steel tubes and 2 tens
rips, under 12 in., 1 up to 3 tons, P'gh, 3.00c. to 3.15c.	4100 Chromium Molybdenum (0.25 to 0.40	2 tens and 1 five on charcoal iron tubes.
	Molybdenum)	
rips, under 12 in., 1 up to 3 tons, Cleve-	Molybdenum)	Standard Commercial Seamless Boiler
rips, under 12 in., 1 up to 3 tons, Cleve- land	4600 Nickel Molybdenum (0.20 to 0.80 Mo- lybdenum, 1.25 to 1.75 Nickel) 3.70 5100 Chromium Steel (0.60 to 0.90 Chrome) 3.00	Tubes
rips, under 12 in., 1 up to 3 tons, Cleve- land	4600 Nickel Molybdenum (0.20 to 0.30 Mo- lybdenum, 1.25 to 1.75 Nickel) 8.70 5100 Chromium Steel (0.60 to 0.90 Chrome) 3.00 5100 Chromium Steel (0.80 to 1.10 Chrome) 8.10 5100 Chromium Spring Steel2.85	Tubes
rips, under 12 in., 1 up to 3 tons, Cleve- land	4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel) 3.70 5100 Chromium Steel (0.60 to 0.90 Chrome) 8.00 5100 Chromium Steel (0.80 to 1.10 Chrome) 8.10 5100 Chromium Steel (0.80 to 1.10 Chrome) 8.10 5100 Chromium Steel (0.80 to 1.30 Chrome) 8.10 5100 Chromium Vanadium Bars	Tubes
rips, under 12 in., 1 up to 3 tons, Cleve- land	Mickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel) 3.70	Tubes
ips, under 12 in., 1 up to 3 tons, Cleve- and	4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel) 3.70	Tubes Cold Drawn 1 in
rips, under 12 in., 1 up to 3 tons, Cleve- and	100 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel) 3.70	Tubes Cold Drawn 1 in 60 3 in 45 1½ to 1½ in. 52 3½ to 3½ in. 47 1¾ in 36 4 in 50 2 to 2¼ in. 31 4½, 5 and 6 in. 45 Hot Rolled
rips, under 12 in., 1 up to 3 tons, Cleveland	100 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel) 3.70	Tubes Cold Drawn 1 in 60 3 in 45 1½ to 1½ in. 52 3½ to 3½ in. 47 1¾ in 50 2 to 2¼ in. 31 2½ to 2¾ in. 39 Hot Rolled
rips, under 12 in., 1 up to 3 tons, Cleveland	4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel) 3.70 5100 Chromium Steel (0.60 to 0.90 Chrome) 3.00 5100 Chromium Spring Steel 2.85 5100 Chromium Spring Steel 2.85 5100 Chromium Vanadium Bars 3.85 5100 Chromium Vanadium Spring Steel 3.60 9250 Silicon Manganese Spring Steel 2.90 Chrome Nickel Vanadium 4.15 Carbon Vanadium 3.60 Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per 1b. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same anal-	Tubes Cold Drawn 1 in. 60 3 in. 45 1½ to 1½ in. 52 3½ to 3½ in. 47 1¾ in. 36 4 in. 50 2 to 2¼ in. 31 4½, 5 and 6 in. 45 2½ to 2¾ in. 39 Hot Rolled 2 and 2¼ in. 37 3½ and 3½ in. 53 2½ and 2¾ in. 45 4 in. 56 3 in. 51 4½, 5 and 6 in. 51
Prips, under 12 in., 1 up to 3 tons, Cleve- land	4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel) 3.70 5100 Chromium Steel (0.60 to 0.90 Chrome) 3.00 5100 Chromium Spring Steel 2.85 5100 Chromium Spring Steel 3.85 5100 Chromium Vanadium Bars 3.85 5100 Chromium Vanadium Spring Steel 3.60 9250 Silicon Manganese Spring Steel 2.90 Chrome Nickel Vanadium 4.15 Carbon Vanadium 3.60 Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½ in. squares, the price is \$5 a gross	Tubes Cold Drawn 1 in 60 3 in 45 1½ to 1½ in. 52 3½ to 3½ in. 47 1¾ in 36 4 in 50 2 to 2½ in. 31 4½, 5 and 6 in. 45 2½ to 2½ in. 39 Hot Rolled 2 and 2½ in 37 3½ and 3½ in. 53 2½ and 2½ in. 45 4 in 56 3 in 51 4½, 5 and 6 in. 51 Less carloads, 4 points less. Add \$8 per m ton for more than four gages heavier the
Prips, under 12 in., 1 up to 3 tons, Cleve- land	4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel) 3.70 5100 Chromium Steel (0.60 to 0.90 Chrome) 3.00 5100 Chromium Spring Steel 2.85 5100 Chromium Spring Steel 2.85 5100 Chromium Vanadium Bars 3.85 5100 Chromium Vanadium Spring Steel 3.60 9250 Silicon Manganese Spring Steel 2.90 Chrome Nickel Vanadium 4.15 Carbon Vanadium 4.15 Carbon Vanadium 3.60 Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per 1b. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½ in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.	Tubes Cold Drawn 1 in
Prips, under 12 in., 1 up to 3 tons, Cleve- land	4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel) 3.70 5100 Chromium Steel (0.60 to 0.90 Chrome) 3.00 5100 Chromium Steel (0.30 to 1.10 Chrome) 3.10 5100 Chromium Spring Steel 2.85 6100 Chromium Vanadium Bars 3.85 6100 Chromium Vanadium Spring Steel 2.90 Chrome Nickel Vanadium Spring Steel 2.90 Chrome Nickel Vanadium 4.15 Carbon Vanadium 3.60 Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½ in. squares, the price is \$5 a gross ton above the 4 x 4 billet price. Slabs with sectional area of 16 in. or over carry the billet price; slabs with sectional area	Tubes Cold Drawn 1 in
rips, under 12 in., 1 up to 3 tons, Cleveland	4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel) 3.70 5100 Chromium Steel (0.60 to 0.90 Chrome) 3.00 5100 Chromium Steel (0.80 to 1.10 Chrome) 3.10 5100 Chromium Spring Steel 2.85 5100 Chromium Vanadium Bars 3.85 5100 Chromium Vanadium Bars 3.85 5100 Chromium Vanadium Spring Steel 2.90 Chrome Nickel Vanadium 4.15 Carbon Vanadium 4.15 Carbon Vanadium 3.60 Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per 1b. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½ in. squares, the price is \$5 a gross ton above the 4 x 4 billet price. Slabs with sectional area of 16 in. or over carry the billet price; slabs with sectional area of 12 in. to 16 in. carry a \$5 extra above the billet price and slabs with a sectional area under	Tubes Cold Drawn 1 in
rips, under 12 in., 1 up to 3 tons, Cleve- land	4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel) 3.70 5100 Chromium Steel (0.60 to 0.90 Chrome) 3.00 5100 Chromium Steel (0.80 to 1.10 Chrome) 3.10 5100 Chromium Spring Steel 2.85 6100 Chromium Vanadium Bars 3.85 6100 Chromium Vanadium Bars 3.60 9250 Silicon Manganese Spring Steel 2.90 Chrome Nickel Vanadium 4.15 Carbon Vanadium 3.60 Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½ in. squares, the price is \$5 a gross ton above the 4 x 4 billet price. Slabs with sectional area of 16 in. or over carry the billet price; labs with sectional area of 12 in. to 16 in. carry a \$5 extra above the billet price and slabs with a sectional area under 12 in. carry the bar price.	Tubes Cold Drawn 1 in 60 3 in 45 1½ to 1½ in 52 3½ to 3½ in 47 1½ in 36 4 in 50 2 to 2½ in 31 4½, 5 and 6 in 45 2 to 2½ in 37 3½ and 3½ in 53 Hot Rolled 2 and 2¼ in 37 3½ and 3½ in 53 2½ and 2¾ in 45 4 in 56 3 in 51 4½, 5 and 6 in 51 Less carloads, 4 points less. Add \$8 per ston for more than four gages heavier than folding 24 ft. Sizes smaller than 1 in. a lighter than standard gage to be held at a chanical tubes list and discount. Intermediasizes and gages not listed take price of ne larger outside diameter and heavier gage.
rips, under 12 in., 1 up to 3 tons, Cleveland	4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel) 3.70 5100 Chromium Steel (0.60 to 0.90 Chrome) 3.00 5100 Chromium Steel (0.80 to 1.10 Chrome) 3.10 5100 Chromium Spring Steel 2.85 5100 Chromium Vanadium Bars 3.85 5100 Chromium Vanadium Bars 3.85 5100 Chromium Vanadium Spring Steel 2.90 Chrome Nickel Vanadium 4.15 Carbon Vanadium 4.15 Carbon Vanadium 3.60 Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per 1b. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½ in. squares, the price is \$5 a gross ton above the 4 x 4 billet price. Slabs with sectional area of 16 in. or over carry the billet price; slabs with sectional area of 12 in. to 16 in. carry a \$5 extra above the billet price and slabs with a sectional area under 12 in. carry the bar price. Band slzes are 40c. per 100 lb. higher.	Tubes Cold Drawn 1 in
rips, under 12 in., 1 up to 3 tons, Cleve- land	4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel) 3.70 5100 Chromium Steel (0.60 to 0.90 Chrome) 3.00 5100 Chromium Steel (0.80 to 1.10 Chrome) 3.10 5100 Chromium Spring Steel 2.85 6100 Chromium Vanadium Bars 3.85 6100 Chromium Vanadium Spring Steel 3.60 9250 Silicon Manganese Spring Steel 2.90 Chrome Nickel Vanadium 4.15 Carbon Vanadium 3.60 Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½ in. squares, the price is \$5 a gross ton above the 4 x 4 billet price. Slabs with sectional area of 16 in. or over carry the billet price; slabs with sectional area of 12 in. to 16 in. carry a \$5 extra above the billet price and slabs with a sectional area under 12 in. carry the bar price. Band sizes are 40c. per 100 lb. higher.	Tubes Cold Drawn 1 in
rips, under 12 in., 1 up to 3 tons, Cleveland	4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel) 3.70 19bdenum, 1.25 to 1.75 Nickel) 3.70 5100 Chromium Steel (0.60 to 0.90 Chrome) 3.00 5100 Chromium Spring Steel 2.86 5100 Chromium Vanadium Bars 3.85 5100 Chromium Vanadium Bars 3.85 5100 Chromium Vanadium Spring Steel 2.90 Chrome Nickel Vanadium 4.15 Carbon Vanadium 4.15 Carbon Vanadium 3.60 Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per 1b. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½ in. squares, the price is \$5 a gross ton above the 4 x 4 billet price. Slabs with sectional area of 16 in. or over carry the billet price; slabs with sectional area of 12 in. to 16 in. carry a \$5 extra above the billet price in. carry the bar price. Band sizes are 40c. per 100 lb. higher. Rails Per Gross Ton Standard, £0.b. mill 435.00	Tubes Cold Drawn 1 in
trips, under 12 in., 1 up to 3 tons, Cleveland	4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel) 3.70 5100 Chromium Steel (0.60 to 0.90 Chrome) 3.00 5100 Chromium Steel (0.80 to 1.10 Chrome) 3.10 5100 Chromium Spring Steel 2.85 6100 Chromium Vanadium Bars 3.85 6100 Chromium Vanadium Spring Steel 3.60 9250 Silicon Manganese Spring Steel 2.90 Chrome Nickel Vanadium 4.15 Carbon Vanadium 4.60 Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per 1b. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½ in. squares, the price is \$5 a gross ton above the 4 x 4 billet price. Slabs with sectional area of 16 in. or over carry the billet price; slabs with sectional area of 12 in. to 16 in. carry a \$5 extra above the billet price and slabs with a sectional area under 12 in. carry the bar price. Band sizes are 40c. per 100 lb. higher. Rails	Tubes Cold Drawn 1 in

pack. The common estimate is that tin plate production this year will run between that of 1926 and 1927, or, figuring 1926 as 100 per cent, at 95 per cent.

Cold-Finished Steel Bars.—Orders and specifications individually are smaller than they were a month or six weeks ago, but are numerous enough to provide a fairly satisfactory volume and are still coming in steadily. The price is steady at 2.20c., base Pittsburgh.

Bolts, Nuts and Rivets.—Bolt and nut business has tapered off about 10 per cent from its recent rate, which was sufficient to provide engagement of about 60 to 65 per cent of productive capacity. Prices are firm. Rivets also are firmly held.

Hot-Rolled Strips.—Most makers are well sold up on widths of 3-in. and less and are not much interested in additional business except at the full quotation of 2.20c., base Pittsburgh, but on wider stock the prices vary with the individual maker. While business is being booked at 2.10c., base, for the 3 to 6-in. bracket, it is not claimed that this is minimum. Similarly with 6 to 12-in. strips, 1.90c. is being done, but is not as low as has been reported. On 12-in. and wider strip, prices are very irregular and reflect the weakness of blue annealed sheets. The movement on old business is reported good, but local mills have noticed some tapering in new business so far this month compared with the same period last month.

Cold-Rolled Strips.—On the small tonnages 2.90c. for 3 tons or more is being done, but the tonnage buyers generally are finding accommodation at 2.75c. The market has failed to make its advance, primarily because competition for orders has been sharp, but the break in full finished sheets which forced strip fender stock lower has been an important contributing factor, since it has rarely happened that the general line has stayed up in price when fender stock was going the other way.

Coke and Coal.—The market is dull, soft and featureless, except that slack coal no longer is showing a price tendency contrary to the general market. The Southern fields are producing and shipping a good deal of screened coal to the Lakes as a result of the restoration of the former differential between rail rates on Northern and Southern coal. The production of slack consequently is heavy in the South, which is supplying a demand that recently was coming to this district. While the local supply still is light, sales are possible only at a recession of 10c. a ton from last week's prices. Foundries seem to be specifying a little more freely against contracts for foundry coke, but there is no improvement in the demand for spot tonnages of that or furnace coke. Buyers are able to dictate prices on spot coke, both furnace and foundry.

Warehouse Prices, f.o.b. Pittsburgh

warehouse Frices, 1.0.0. Fittsburgh	
Basi	e per Lb.
Structural shapes	3.00c. 3.00c. 2.90c. 2.75c.
Rounds and hexagons	4.10c.
Hoops4.00c. to	
Black sheets (No. 24 gage), 25 or more bundles	3.65c.
	4.50c.
	3.10c.
Galvanized corrugated sheets (No. 28 gage), per square	\$4.39
Small	3.40c. 5.25c. 3.80c.
Track bolts, all sizes, per 100 count,	off list
Machine bolts, per 100 count60 per cent c Carriage bolts, per 100 count60 per cent c Nuts, all styles, per 100 count60 per cent c	off list
Large rivets, base per 100 lb Wire, black soft annealed, base	\$3.50
per 100 lb	
100 lb	3.10 3.00 3.05

Old Material.—A few small lots of heavy melting steel shipped without orders have been taken in at \$15 at one point in the district, but \$15.25 is as low as dealers are obliged to go on direct inquiry. The offerings of this grade in the May list of the Pennsylvania Railroad were sold to dealers at around \$15.50, some going to three points in the Pittsburgh district. The railroad scrap is applied against orders carrying from \$15.75 to \$16; it is doubtful if less could be done today on sizable lots. Most of the tonnage sold during the week was at \$15.50. Scrap prices generally show no important change. Compressed sheets still are hard to obtain at less than \$15.50. The May list of the Norfolk & Western, closing May 10, contains 5030 gross tons.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Furnace G	rades:	
No. 1 heavy melting steel	15.00 to \$	15.75
Scrap rails	15.00 to	15.25
Compressed sheet steel	15.00 to	15.50
Bundled sheets, sides and ends	14.00 to	14.50
Cast iron carwheels	14.50 to	15.00
Sheet bar crops, ordinary	15.50 to	16.00
Heavy breakable cast	13.00 to	13.50
No. 2 railroad wrought	15.50 to	16.00
Heavy steel axle turnings	13.00 to	13.50
Machine shop turnings	10.25 to	10.50
Acid Open-Hearth Furnace G	rades:	
Railroad knuckles and couplers	16.50 to	17.00
Railroad coil and leaf springs	16.50 to	17.00
Rolled steel wheels	16.50 to	17.00
Low phosphorus billet and bloom		
ends	18.50 to	19.00
Low phosphorus, mill plate	17.50 to	18.00
Low phosphorus, light grade	16,50 to	17.00
Low phosphorus sheet bar crops.	17.50 to	18.00
Heavy steel axle turnings	13.00 to	13.50
Electric Furnace Grades:		
Low phosphorus punchings	16.50 to	17.00
Heavy steel axle turnings	13.00 to	13.50
Blast Furnace Grades:		
Short shoveling steel turnings	11.00 to	11.25
Short mixed borings and turnings	11.00 to	11.25
Cast iron borings	11.00 to	11.25
No. 2 busheling	10.50 to	11.00
Rolling Mill Grades:		
Steel car axles	18.00 to	19.00
No. 1 railroad wrought	11.00 to	11.50
Sheet bar crops	17.00 to	17.50
Cupola Grades:		
No. 1 cast	14.50 to	15.00
Rails 3 ft. and under		16.00
Malleable Grades:	10.00 00	20.00
Railroad	15 00 to	15.75
		15.25
	14.00 to	14.75
Agricultural	14.00 00	17.10

Steel Cargoes to Move on Great Lakes

A Chicago dock company has arranged to unload a boat of reinforcing bars bound from Buffalo to Milwaukee. A boat load of rails has been assembled at Chicago for water shipment to Port William, Ont., on Lake Superior. The National Terminals Corporation, East Chicago, plans to have three boats of 3000 tons each in operation between Chicago and Buffalo.

The Newton Steel Co., Youngstown, is offering an issue of new 6 per cent preferred stock to replace the present 7 per cent issue and to provide funds for plant improvements. The present outstanding preferred, in par amount of \$538,500, is to be retired July 1. The financial statement shows that the company has total assets of \$6,704,373 and net tangible assets of \$5,974,857 applicable to the preferred stock.

"Power Capacity and Production in the United States" is the title of Water Supply Paper 579, issued by the United States Geological Survey. It covers 210 pages dealing with water-power and power produced by fuels. The data are given in great profusion, with numerous diagrams. Some of the figures go back almost 80 years.

Construction volume in April showed a considerable improvement over the earlier months of the year, according to figures of the Associated General Contractors of America. The index is given as 164, compared with 137 in March and with 166 in April, 1927.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms	Slabs	Wire Rods
Per Gross Ton	Per Gross Ten	
Rerolling, 4-in. and over	8 in. x 2 in. and larger	*Common soft, base
Sheet Bars	Per Lb.	
Open-hearth or Bessemer\$34.00	Grooved	*Chicago mill base is \$45. Cleveland mill base, \$44.
	Prices of Raw Material	
Ores	Ferromanganese	Fluxes and Refractories
Lake Superior Ores. Delivered Lower	Per Gross Ton	Phorener
Lake Ports Per Gross Ton Old range Bessemer, 51.50% iron	Domestic, 80%, furnace or seab'd\$100.00 Foreign, 80%, Atlantic or Gulf port, duty paid 100.00 Spiegeleisen Per Gross Ton Furnace Domestic, 19 to 21%\$31.00 to \$32.00 Domestic, 16 to 19%29.00 Electric Ferrosilicon	Per Net Ton Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines
Manganese ore, washed, 52% manganese, from the Caucasus	Section Sect	Pire Clay Per 1000 f.o.b. Works First Quality Second Quality Sec
Coke	Silvery Iron	per ton 7.00
Furnace, f.o.b. Connellsville prompt \$2.60 to \$2.75 Foundry, f.o.b. Connellsville prompt \$3.50 to 4.25 Foundry, by-product, Ch'go ovens. Foundry, by-product, New England, del'd \$11.00 Foundry, by-product, Newark or Jersey City, delivered \$9.00 to 9.40 Foundry, Birmingham 5.00	F.o.b. Jackson County, Ohio, Furnace Per Gross Ton Per Gross Ton	Silica Brick Per 1000 f.o.b. Works
Coal Coal Per Net Ton Mine run steam coal, f.o.b. W. Pa. mines	del'd	Magnesite Brick Per Net Ton Standard sizes, f.o.b. Baltimore and Chester, Pa

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts	
Per 100 Pieces	
F.o.b. Pittsburgh, Cleveland, Birmingham (Chicago)	r
Per Cent Off Li	38
Machine bolts	
Carriage bolts	
Lag bolts	
Plow bolts, Nos. 1, 2, 3 and 7 heads	
Hot-pressed nuts, blank or tapped, square	
Hot-pressed nuts, blank or tapped, hexagons	
C.p.c. and t. square or hex. nuts, blank or tapped	
Washers*6.75c. to 6.50c. per lb. off li	

*F.o.b. Chicago, New York and Pittsburgh.

Bolts and Nuts

Per Cent Off List

Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55 to 60 per cent apply.

Large Rivets

(1/2-In. and Larger)

Base per 100 Lb.

Small Rivets

(74-In. and Smaller)

Cap and Set Screws

Chicago

Steel Demand Continues Heavy—100,000 Tons of Structural Projects Pending

CHICAGO, May 8.—Sustained demand continues to hold production of steel at Chicago district mills at 95 per cent of ingot capacity. The outlook is encouraging, particularly in structural steel in which there are active projects totaling 100,000 tons, including 50,000 tons for the Chicago Mercantile Mart.

Steel sales are being made at a remarkably steady rate, although in some instances at prices below 2c., Chicago, for bars, shapes and plates. The lower quotations have not greatly affected the immediate Chicago territory, being most common in outlying sections. Chicago producers are hopeful that third quarter prices will hold at the second quarter level.

Evidence is at hand that a number of large users who normally carry 8000 to 15,000 tons of finished steel in stock have allowed steel on hand to become low,

and inquiries now before the trade indicate an interest in the building up of stocks.

Three gas line projects, one to Omaha, another to Kansas City and a third to St. Louis, are still in the stage of being financed, but a tentative agreement is said to have been reached with a Western maker for the steel pipe needed for one of the lines. The Missouri Pacific has placed 3000 tons of steel for a bridge at Little Rock, Ark.

Pig Iron.-A Federal furnace was blown out May 8. Merchant stacks now in blast are one Federal, two Iroquois and the furnace at Duluth. The change this week was made necessary by needed repairs and plant improvements. Furnace stocks, which are unusually heavy, will act as a balance against demand during the coming months. Shipments this month continue at the April rate, but new sales are declining in vol-A Milwaukee melter has taken 1500 tons of Northern iron, and several fresh inquiries for lots of about 500 tons each are before the trade. A 2000-ton cargo of iron brought from Cleveland by boat has been unloaded at Chicago and another boat is expected here this week. Mixed cargoes of pig iron and steel are scheduled to arrive here from Buffalo at the rate of one a week. Iron brought by boat brings \$18, Chicago, on contract, while spot sales from that source and iron made locally are steady at \$18.50. The 700-ton inquiry for silvery iron reported a week ago has been withdrawn. The trend of prices for this commodity is still somewhat uncertain. Southern iron, marked off 50c. a ton in some sections, is still being sold in this district on the basis of \$16, Birmingham.

 Prices per gross ton at Chicago:
 Northern No. 2 foundry, sil. 1.75

 to 2.25
 \$18.50

 N'th'n No. 1 fdy., sil. 2.25 to 2.75
 19.00

 Malleable, not over 2.25 sil.
 18.50

 High phosphorus
 18.50

 Lake Superior charcoal, averaging sil. 1.50
 27.04

 Southern No. 2 fdy. (all rail)
 22.01

 Southern No. 2 (barge and rail)
 21.18

 Low phos., sil. 1 to 2 per cent.
 29.00

 Silvery, sil. 8 per cent
 29.79

 Bessemer ferrosilicon, 14 to 15
 46.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—From the viewpoint of actual sales, this market is quiet, but specifications are large. Users of ferromanganese are taking increased quantities, probably as a result of reports that prices for the third quarter will be advanced.

Prices delivered Chicago: 80 per cent ferromanganese, \$107.56: 50 per cent ferrosilicon, \$83.50 to \$87.50; spiegeleisen, 19 to 21 per cent, \$38.76 to \$39.76.

Plates.—Reports of the last few weeks that oil consumption is keeping pace with production are reflected in the scarcity of plate orders for tank construction. A purchase by a west Texas producer is for 1000 tons, but other users are finding need only for miscellaneous small tonnages. The only railroad car business of note this week is an order for 300 gondola cars placed with the Siems-Stembel Co. by the Chicago, Minneapo-

lis, St. Paul & Omaha. This railroad will buy 450 additional cars, of which 250 will be stock cars. Reports are persistent here that both the New York Central and the Pennsylvania will be ready to inquire for large numbers of cars before July 1. Heavy specifications against recent railroad equipment orders are nearing an end, car builders having already made known not less than 75 per cent of their requirements necessary to build the cars for the St. Paul. Miscellaneous business in plates continues to run heavy, and local producers are engaged at close to 95 per cent of capacity. Deliveries range from four to six weeks, a condition unchanged for over a month. Shipping schedules are heaviest on the narrow width of universal mill products. Users are finding that prices are somewhat unstable, particularly in the extreme eastern portion of this district and in the Southwest, also to some extent in central and southern Illinois. Business, attractive from the viewpoints of tonnage or rolling mill schedules, has been taken in these districts at \$1 below the prices that are being maintained in and near Chicago.

Mill prices on plates per lb.: 2.00c., base Chicago. Structural Material.—Fresh inquiry shows a decided turn for the better, although as yet shops are not free from schedule troubles resulting from an inadequate number of small fill-in jobs. Large shops in this district are operating at close to capacity, while those of smaller output will not average above 70 per cent. To the west, in such centers as Omaha, fabricators are busy, but prices obtained are low. Of special note is an announcement that the project formerly known as the Marshall Field & Co. warehouse has been renamed the Mercantile Mart, and in the redesigning the build-ing has been greatly enlarged. Local interests believe that the steel requirements will be well in excess of 50,000 tons. Reconstruction of the Fine Arts Building, Chicago, will take 5000 tons, or about double the figure previously reported. Other large inquiries include 3600 tons for a court house at Denver, Colo.; 1000 tons for a railroad station at South Bend, Ind.; 1000 tons for a meat packing building at St. Louis, and 2500 tons for a race track pavilion at Glenview, Ill. Among recent awards in Chicago are two apartment buildings taking 500 tons of steel. Structural mills are well engaged, and deliveries are not better than four weeks in most

Mill prices on plain material per lb.: 2.00c., base, Chicago.

sizes of structural shapes.

Bars.-Users of soft steel bars are entering liberal specifications, and local mills are engaged at close to capacity. Producers of cold-drawn bars are taking large quantities and reinforcing bar warehouses are drawing out larger tonnages. Demand by farm implement manufacturers is steady, but lighter shipments to that industry are expected by the end of the month, when all but the tractor plants that are far behind on orders will close down for a seven to 10-day inventory period. Reports from farm districts indicate that dealers' stocks of farm machinery are low and manufacturers expect to forge ahead at close to top speed by the third week in June. Some unsteadiness in soft steel bar prices is found in outlying territory. In and near Chicago 2c. is the ruling quotation. Railroads continue to enter liberal orders for iron bars, and mill output is the heaviest in months. Prices are unchanged at 2c., Chicago. Demand for alloy steel bars is active, and specifications entered at mills by users are keeping schedules well filled. Specifications for rail steel bars have fallen below shipments, forestalling for the present at least a lengthening of mill operating hours. Shipments last month were the largest for any April since 1920. New business is widely scattered and comes to mills in small lots, so indications are that the May demand will not compare favorably with that in the preceding month. Reinforcing bars now represent a large part of present output. Deliveries are reasonably prompt, ranging from 10 days to two weeks, and prices are steady at 1.85c., Chicago Heights.

Mill prices per lb.: Soft steel bars, 2.00c. base, Chicago; common bar iron, 2.00c., base, Chicago; rail steel bars, 1.85c., base, Chicago Heights mill.

Rails and Track Supplies.—The local rail market is quiet from the viewpoint of new sales. Shipments, however, are steady. In some quarters it is believed that the secondary buying movement may come short of the volume placed a year ago for the reason that

last fall railroads were less hesitant to take options than has been the case in recent years. Miscellaneous orders for track accessories total 4000 tons. New inquiry, which is not large, includes one lot of 2000 kegs of track bolts. Prices for tie plates are steady at \$43 a net ton.

Prices f.o.b. mill, per gross ton: Standard-section open-hearth and Bessemer rails, \$43; light rails, rolled from billets, \$36. Per lb.: Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.25c.; angle bars, 2.75c.

Sheets.—This market continues unsettled. One group of hot mills was shut down Friday of last week and did not resume operations until Tuesday of this week, and then only with a schedule arranged for four days. Specifications against contracts are a trifle more liberal, but new buying, even at lower prices, is slow. Jobbers are reducing stocks and are sending only small orders to mills.

Base prices per lb., delivered from mill in Chicago: No. 24 black, 2.90c. to 3.05c.; No. 24 galvanized, 3.75c. to 3.99c.; No. 10 blue annealed, 2.20c. to 2.35c. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Cast Iron Pipe.-Detroit has awarded 12,000 tons of pipe to five bidders. The United States Cast Iron e & Foundry Co. took 5750 tons at \$38.65 a ton, delivered, or \$30.73, Birmingham; 3000 tons will be furnished by French makers at \$29; other successful bidders were the American Cast Iron Pipe Co., 1000 tons at \$30.08, Birmingham; National Cast Iron Pipe Co., 750 tons, and James B. Clow & Sons, 1500 tons. The United States company has been awarded 2800 tons of 24-in. and 48-in. pipe by Milwaukee, and the National Cast Iron Pipe Co. has taken 550 tons of 6 to 24-in. pipe for Royal Oak, Mich. The price of the latter award was \$30.30, Birmingham. John A. McDace & Co., contractors at Detroit, have been awarded 28,000 ft. of pipe by Dearborn, Mich. Recent awards indicate a stiffening in prices. Sizable tonnages have been taken in this district as high as \$33, Birmingham, while prices paid at Detroit show that minimum quotations for American-made pipe are now above \$30. Several orders have been placed by railroads and public utilities.

Prices per net ton, delivered Chicago: Water pipe, 6-in. and over, \$38.20 to \$41.20; 4-in., \$42.20 to \$45.20; Class A and gas pipe, \$4 extra.

Reinforcing Bars.—Awards for the week bulk large, and a round tonnage of active projects is before the trade. The Truscon Steel Co. has taken 800 tons of billet steel reinforcing bars for a sewer job and a rail steel mill has taken two orders that total 800 tons. Shops in this district are engaged at 80 per cent of capacity or better, a little less favorable position than they occupied at this time a year ago. A new hotel in Chicago will take 1000 tons and the Chicago Motor Club Building calls for 400 tons. Recent awards have been keenly contested as to price, billet bar quotations having dipped to 2.10c. a lb., Chicago warehouses. Prices for the hard steel bar commodity are steady at 1.85c., Chicago Heights. Awards and inquiries are shown on page 1363.

Wire Products.—As a whole, this market is steady and mills continue to produce at close to 70 per cent

Warehouse Prices, f.o.b. Chicago

	True and a record record of the record of th
	Base per Lb.
Sof	ttes and structural shapes. 3.10c. ft steel bars. 3.00c. inforcing bars, billet steel 2.15c. to 2.40c. id-finished steel bars and shafting— Rounds and hexagons. 3.60c.
	Flats and squares 4.10c.
	nds
Bla	ack sheets (No. 24)
Blu	ne annealed sheets (No. 10) 3.50c.
Spi	ikes, standard railroad
Riv	vets, structural 3.60c.
Riv	vets, boiler 3.60c. Per Cent Off List
Ma	chine bolts
Co	ach or lag screws
Ho	t-pressed nuts, squares, tapped or blank. 60 t-pressed nuts, hexagons, tapped or blank. 60
No	. 8 black annealed wire, per 100 lb\$3.30
Co	mmon wire nails, base per keg 3.10 ment coated nails, base per keg 3.10
-	

of capacity. Jobbers in the Northwest are finding business brisk, and sales in Texas and the lower Mississippi Valley are in good volume. Nails are moving slowly, and prices are not more stable than a week ago. Mill stocks of nails are large for this time of the year. The movement of woven wire fencing has been heavy against orders taken in the late winter, and producers' stocks are not large. A secondary buying movement is under way, pointing to a demand that will carry into the early summer months. Manufacturers' wire is moving at a steady rate. Prices for wire and wire products are given on page 1347.

Bolts, Nuts and Rivets.—Specifications have dropped in volume as a result of lighter requirements by farm implement manufacturing plants, which, with exception of those making tractors, will close about June 1 for inventories. Prices on large rivets are steady at \$3, Chicago.

Coke.—Specifications against contracts are in good volume and prices are steady. All by-product coke ovens in this district are lighted.

Old Materials.—An undertone of weakness is making itself apparent in the local scrap market. A steel mill has taken 2000 tons of heavy melting steel at \$13 a gross ton and a consumer has purchased 2500 tons of rerolling rails at \$14.50. Three thousand tons of railroad malleable has been sold at \$13.50 a gross ton. Rejections of melting steel are numerous and dealers have been forced to pay as high as \$14 a ton to meet obligations. A disturbing condition in this market is that large users more frequently purchase direct from producers of scrap. The Santa Fe and the Chicago & North Western have sold lists totaling 6000 tons.

Prices delivered consumers' yards, Chicago:

Per Gross Ton			
Basic Open-Hearth Grades:			
Heavy melting steel	13.00 to \$	13.50	
Shoveling steel	13.00 to		
apart, and miscellaneous rails.	13.50 to	14.00	
Hydraulic compressed sheets	11.50 to		
Drop forge flashings	9.50 to		
Forged, cast and rolled steel car-			
wheels	15.50 to		
Railroad tires, charging box size	16.75 to		
Railroad leaf springs, cut apart	16.75 to	17.25	
Acid Open-Hearth Grades:			
Steel couplers and knuckles	14.50 to	15,00	
Coil springs	17.00 to	17.50	
Electric Furnace Grades:			
Axle turnings	13.00 to	13.50	
Low phosphorus punchings	14.00 to	14.50	
Low phosphorus plate, 12 in. and		2	
under	14.25 to	14.75	
Blast Furnace Grades:			
Axle turnings	10.00 to		
Cast iron borings	9.25 to	9.75	
Short shoveling turnings	9.25 to	9.75	
Machine shop turnings	7.00 to	7.50	
Rolling Mill Grades:			
Iron rails	14.00 to	14.50	
Rerolling rails	14.00 to	14.50	
Cupola Grades:			
Steel rails less than 3 ft	15.00 to	15.50	
Angle bars, steel	14.25 to	14.75	
Cast iron carwheels	13.50 to		
Malleable Grades:			
Railroad	13.00 to	13.50	
Agricultural	12.00 to	12.50	
The state of the s	14.00 00	14.00	
Miscellaneous:		0= 00	
*Relaying rails, 56 to 60 lb			
*Relaying rails, 65 lb. and heavier	26.00 to	31.00	
Per Net Ton			
Rolling Mill Grades:			
Iron angles and splice bars	14.00 to	14.50	
Iron arch bars and transoms	19.00 to	19.50	
Iron car axles	21.50 to	22.00	
Steel car axles	16.00 to	16.50	
No. 1 railroad wrought	11.50 to	12.00	
No. 2 railroad wrought	11.25 to	11.75	
No. 1 busheling	10.00 to	10.50	
No. 2 busheling	5.75 to	6.25	
Locomotive tires, smooth	12.50 to	13.00	
Pipes and flues	8.00 to	8.50	
Cupola Grades:			
No. 1 machinery cast	14.00 to	14.50	
No. 1 railroad cast	12.75 to	13.25	
No. 1 agricultural cast	12.50 to	13.00	
Stove plate	11.25 to	11.75	
Grate bars	11.25 to	11.75	
Brake shoes		11.50	

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Philadelphia

Shape Prices Recede Slightly-Basic Iron Lower on Recent Large Sale

PHILADELPHIA, May 8.—Producers of plates, shapes and bars are receding slightly from the firm stand they have recently taken on prices. Structural shapes are now quite generally quoted at 2c., Bethlehem, or 2.13c., delivered Philadelphia, instead of 2.05c., which was named for second quarter. A nearby producer of shapes has quoted delivered prices as low as 2.06c., Philadelphia, and this has been met on the more desirable tonnages by other eastern Pennsylvania mills. On plates, 2.05c., Coatesville, is still the asking price, but competition for business brings out 2c. quotations frequently. Steel bars range from 1.85c. to 1.90c., Pittsburgh, but there is a disposition on the part of mills to accept 1.85c. on some orders that would recently have been unattractive at less than 1.90c.

Producers of blue annealed sheets are still quoting 2.10c., Pittsburgh, on the average run of orders, but buyers have been able to get quotations of 2c. and 2.05c. on the more attractive lots. Black sheets range from 2.70c. to 2.75c. and galvanized from 3.60c. to 3.70c., Pittsburgh.

Basic pig iron is 50c. a ton lower in this market on sales of close to 30,000 tons to two Eastern steel makers. It is now quoted at \$19 to \$19.50, delivered.

Pig Iron.—Foundry grades are fairly firm at \$20, base furnace. Business is limited to occasional carload lots. Basic iron, on recent sales of 6000 to 7000 tons to one steel company and 20,000 to 25,000 tons to another, is quotable at \$19 to \$19.50 per ton, delivered, a decline of 50c. a ton. The tonnage taken by the latter was divided among three eastern Pennsylvania furnaces. Low phosphorus buying is confined to small lots, on which the published market prices apply, although sales to consumers in western Pennsylvania and other districts have been made at concessions. Buffalo foundry iron bought for delivery by barge is being shipped to consumers in this district; the total sold is estimated at from 20,000 to 30,000 tons.

)	rices per gross ton at Philadelphia:		
	East. Pa. No. 2 plain, 1.75 to 2.25		
	Sil. East. Pa. No. 2X, 2.25 to 2.75 sil.		\$20.76 21.26
	East. Pa. No. 1X		21.76
	Basic (delivered eastern Pa.)\$19.00		
	Gray forge		
	Malleable	to	21.50
	York State furnace) 22.00	10	23.00
	Copper bearing low phos. (f.o.b. furnace)	to	24.00
	Virginia No. 2 plain, 1.75 to 2.25	LU	24,00
	sil 24.54	to	25.04
	Virginia No. 2X, 2,25 to 2.75 sil., 25.04	10	25.54

Prices, except as specified otherwise, ar delivered Philadelphia. Freight rates: 76c. to \$1.64 from eastern Pennsylvania furnaces; \$4.5 from Virginia furnaces.

Warehouse Prices, f.o.b. Philadelphia

	Base per	r Lb.
Plates, ¼-in. and heavier	2.80c. to	3.00c.
Soft steel bars, small shapes and iron bars (except bands) Round-edge iron Round-edge steel, iron finished		2.50c. 3.50c.
1½ x 1½ in		3.50c. 4.30c.
twisted and deformed Cold-finished steel, rounds and		
hexagons Cold-finished steel, squares and flats		3.35c. 3.85c.
Steel hoops		3.60c.
inclusive		3.35c. 5.00c. 4.00c.
†Galvanized sheets (No. 24) Blue annealed sheets (No. 10)		4.75c. 3.15c.
Diamond pattern floor plates— ½-in ½-in. Rails Swedish iron bars.		5.30c. 5.50c. 3.20c. 6.60c.

*For 50 bundles or more; 10 to 49 bundles, 4.25c. base; 1 to 9 bundles, 4.50c. base. †For 50 bundles or more; 10 to 49 bundles, 5.10c. base; 1 to 9 bundles, 5.45c. base.

Ferromanganese.-Quotations are unchanged at \$100 per ton, seaboard. Current business is confined largely to shipments against contracts. Apparently neither domestic nor foreign sellers are desirous of quoting for the second half, and thus far consumers have shown little interest in further contracting.

-The current market is quotable at 1.85c. to 1.90c. per lb., base Pittsburgh, or 2.17c. to 2.22c. per lb., Philadelphia. New orders are limited both in number and in size, but there is a fair tonnage moving on second quarter contracts.

Shapes .- Mills are fairly well booked with business in the smaller sizes, but on larger specifications, where the competition of special beams rolled by two companies is encountered, there is a tendency to shade On small sizes and limited tonnages, 2.05c. per lb., Bethlehem, or 2.18c. per lb., Philadelphia, is still obtained by some mills, but on medium-sized and large lots, 2c., Bethlehem, or 2.13c., Philadelphia, usually applies. One producer is reported to be quoting delivered prices on shapes as low as 2.06c. per lb., Philadelphia, or 2c., f.o.b. mill, and this competition has been met by other eastern Pennsylvania producers. Fabricators are moderately well booked with business, and there is a fair volume of small projects in the market.

Plates.-Prices on plates are 2.05c., Coatesville, or 2.15c., Philadelphia, on small orders and 2c., Coatesville, or 2.10c., Philadelphia, on the more desirable business. Shipments on second quarter contracts are good, but new business is limited.

Sheets.-There is only a small tonnage of new business in the market. Prices on blue annealed, black and galvanized sheets continue irregular. Eastern Pennsylvania mills are still endeavoring to maintain the blue annealed sheet market at 2.10c. per lb., base Pittsburgh, notwithstanding sales to automobile body builders and other large users at 2c. and 2.05c., Pittsburgh. Black sheets range from 2.70c. to 2.75c., Pittsburgh, and galvanized from 3.60c. to 3.70c.

Old Material.-Prices of all grades are unchanged. Only a moderate tonnage is moving to consumers. No. 1 heavy melting steel is being shipped from the Baltimore district to Steelton, Pa., at \$13.50 per ton, delivered, which nets the seller considerably less than on the Sparrows Point, Md., contract at the same price. Shipments to the latter mill, however, have been suspended. A consumer at Phoenixville, Pa., is offering \$11.50 per ton for stove plate and \$10.50 per ton for machine shop turnings, but no contracts are reported at these prices, dealers quoting 50c. per ton higher. Brokers are showing increasing interest in export shipments of steel, in the belief that if more scrap is sold abroad there will be less surplus available to depress the market here.

Prices per gross ton delivered consumers' yards, Philadelphia district:

Warehouse Business .- There is a moderate demand for structural material, but competition among jobbers is keen and as low as 2.35c. per lb., base, is occasionally quoted. As a result, the application of quantity differentials on structural steel and plates as well as steel bars, small shapes and cold rolled steel is being considered. The quantity bases on black and galvanized

No. 1 cast...... 16.00 to 16.50 Cast borings (for chemical plant) 14.50 to 15.00

and tubes thew speshafting
Steel axles
No. 1 forge fire.
Steel rails for rolling.
Cast iron carwheels.
No. 1 cast.

12.00 to 17.50 to 19.00 to

sheets are being maintained, although business is small.

Imports.—In the week ended May 5, 2565 tons of chrome ore arrived at this port from Portuguese Africa. No pig iron came in. Steel imports consisted of 52 tons of steel skelp, 16 tons of steel bars and 168 tons of structural shapes from Belgium; 31 tons of steel bands, 35 tons of bars and 6 tons of shapes from France.

New York

Pig Iron Inquiries for Third Quarter— Sheet Prices Weaker

NEW YORK, May 8 .- Pig iron sales are confined mainly to scattered small tonnages for relatively early shipment. Total bookings by local sellers, at 7000 tons, were nearly as large as in the previous week. Outstanding purchases were 1000 tons of foundry, bought by Crane Co., Bridgeport, Conn., and 275 tons, placed by the Worthington Pump & Machinery Corporation, for its Harrison, N. J., works. The Moore Brothers Co., Elizabeth, N. J., closed against its inquiry for 100 tons of No. 3 foundry. Operations among foundries are spotty, but total melt shows little change. Some of the active plants are finding that they underestimated their second quarter requirements. The Thatcher Co., Garwood, N. J., has entered the market for 2000 tons of No. 2 plain for delivery this quarter. The first important inquiries for third quarter have made their appearance. A New Jersey melter wants 1000 to 2000 tons of No. 1X for second and third quarter delivery, and the A. P. Smith Mfg. Co., Bloomfield, N. J., is asking for 600 tons of No. 2 plain and No. 2X for third quarter. New York State foundry iron continues to sell at \$16 to \$16.50, base Buffalo. Eastern Pennsylvania producers are still quoting \$20, base furnace, without taking much business in this section.

Freight rates: \$4.91 from Buffalo, \$1.39 to \$2.52 from eastern Pennsylvania.

Reinforcing Bars .- The Kalman Steel Co. will furnish 2400 tons of bars for a highway bridge at New Brunswick, N. J., and 500 tons of rail steel for the piers of the Hudson River bridge will be supplied by the Truscon Steel Co. Business as a whole, however, has shown little improvement over previous weeks. A number of jobbers in this district are placing considerable tonnages of foreign steel, usually in small lots, but bulking rather large in the aggregate. This steel is offered at prices which distributers of the domestic product seldom attempt to meet and the situation has not led to any material price weakness. Some business is being placed at 2c., Pittsburgh mill, but 1.95c. may be had on attractive tonnages, and in the absence of much activity in the market the entire price structure lacks definite strength. The Youngstown warehouse price is unchanged at 2.20c., or 2.57 1/2 c. on cars at New York, and out of New York warehouse the general quotations are 2.80c. for lots of 5 tons or more, 2.95c. for lots of 2 to 5 tons and 3.24c. for less than 2 tons, all delivered at job.

Finished Steel.—Further weakness in prices of sheets and a declining volume of demand for nearly all steel products are the major developments in this market. Black sheets have been sold at 2.65c. and 2.70c., Pittsburgh, and 2.75c., which was recently the low, is now regarded as the top of the market. Galvanized sheets are being commonly sold at 3.60c., Pittsburgh, but a few sales have been made at 3.55c. On blue annealed sheets, quotations of 2c. have become quite general. On plates, little effort is now being made to obtain higher than 2c., Coatesville, except on lots of warehouse size. Concessions from 2c., Coatesville, or 2.17½c. delivered New York, apparently have

not been given in more than a few instances. The smallness of current plate orders accounts in some measure for the fairly steady prices. Shapes are obtainable on the basis of 2c., Bethlehem, while on steel bars quotations of 1.90c., Pittsburgh, are less frequent in view of the willingness of some mills to book average-size orders for early rolling at 1.85c. Although reports are uniformly of a good rate of operations in consuming industries, the volume of steel business, taking specifications against contracts and new orders together, is falling somewhat below the daily rate in April. This situation is taken to mean that consumers are using up stocks and awaiting price developments. clining volume of structural steel business in the New York district is reflected by the total of 28,200 tons booked in April by members of the Structural Steel Board of Trade compared with 32,200 in March and 59,000 tons in April, 1927.

Mill prices per 1b., delivered New York: Soft steel bars, 2.19c. to 2.24c.; plates, 2.12½c. to 2.22½c.; structural shapes, 2.14½c. to 2.13½c.; bar iron, 2.14c.

Warehouse Prices, f.o.b. New York

Re	se per Lb.
Plates and structural shapesSoft steel bars and small shapesron bars fron bars, Swedish charcoal7.00c. to Cold-finished shafting and screw stock—	3.30c. 3.25c. 3.24c. 7.25c.
Rounds and hexagons	3.40c. 3.90c.
Cold-rolled strip, soft and quarter hard, 5.15c. to	
Hoops Bands	4.00c
Bands Blue annealed sheets (No. 10 gage) Long terne sheets (No. 24). Standard tool steel.	3.90c. 5.80c. 12.00c.
Long terne sneets (No. 24) Standard tool steel. Wire, black annealed. Wire, galvanized annealed. Tire steel, 1½ x ½ in. and larger. Smooth finish, 1 to 2½ x ¼ in. and larger Open-hearth spring steel, bases. 4.50c. t	5.15c. 3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases4.50c. t	o 7.00c. Off List
Machine bolts, cut thread: Per Cent % x 6 in. and smaller	55 to 60
Carriage bolts, cut thread:	
½ x 6 in. and smaller50 to 50	55 to 60 and 10
Coach screws:	
1/2 x 6 in. and smaller50 to 56	55 to 60 and 10
Boiler Tubes— Per	100 Ft.
Lap welded steel, 2-in	. 29.24
Charcoal iron, 2-in	. 25.00
Discounts on Welded Pipe	
Standard Steel— Black	
14-in, butt. 46 14-in, butt. 51 1-3-in, butt. 53 24-6-in, lap 48	29 37 39
1-3-in. butt	
7 and 8-in, lap	17 12
Wrought Iron—	1.4
½-in. butt 5	+19
%-in. butt	± 9
2-in. lap	+14
7-12-in. lap 3	+16
Tin Plate (14 x 20 in.) Prime	Seconds
Coke, 100 lb. base box \$6.45	\$6.20
Charcoal, per box A	AAA
IC \$9.70	\$12.10
IX 12.00 IXX 13.90	16.00
Terne Plate (14 x 20 in.)	
IC—20-lb. coating. \$10.00 IC—30-lb. coating. 12.00 IC—40-lb. coating. 13.75	to \$11.00 to 13.00
Sheets, Box Annealed—Black, C. R. O	10 14.25 no Pass
Sheets, Box Anneated—Black, C. R. O	Per Lb.
Nos. 18 to 20	3.80c.
No. 24	4.00c.
No. 26 No. 28*	4.10c.
No. 30	4.50с.
Sheets, Galvanized	Per Lb.
No. 14	4.35c.
No. 18	4.30C.
No. 20 No. 22	4.50C.
No. 24	4.70c.
No. 26 No. 28*	5.20c.
No. 30	5.60c.
*No. 28 and lighter, 36 in. wide, 20 per 100 lb.	c. higher

Warehouse Business.—Activity is fairly well distributed to all products, but there is some irregularity in the size of tonnages and in prices. Concessions on blue annealed sheets seldom exceed about \$1 per ton, but both black and galvanized sheet sales have been made at reductions of 20c. and 25c. per 100 lb. for small lots, which usually take the full base price and size extras. Jobbers handling structural material report continued competition from imported steel and increasing encroachment on small tonnage business by mills, which are willing to offer prompt shipment.

Cast Iron Pipe.—Makers in the North report sufficient tonnage on their books to carry them, in most cases, for 60 days or more and, as a result, are showing greater firmness on prices. New orders, however, are limited, coming for the most part from private users of pipe. Birmingham foundries are maintaining their price level at \$30 and \$31 per ton, base Birmingham, which is too high to compete with the present quotations of Northern foundries. The inquiry of the city of New York for 2754 tons of pipe is about the only municipal project of consequence, but there are some sizable private purchases in prospect.

Prices per net ton, delivered New York; Water pipe 6-in. and larger, \$37.60 to \$38.60; 4-in. and 5-in., \$42.60 to \$43.60; 3-in., \$52.60 to \$53.60; Class A and gas pipe, \$4 to \$5 extra.

Coke.—The market is quiet and prices of all grades unchanged. Furnace coke continues at about \$2.75 per ton, Connellsville, and standard Connellsville furnace coke at about \$3.75 per ton. Delivered prices on special brands of foundry coke are: To northern New Jersey, Jersey City and Newark, \$8.71 to \$8.81 per net ton; to New York and Brooklyn, \$9.59 to \$9.69 per net ton. By-product coke ranges from \$9 to \$9.40 per net ton, Newark or Jersey City, N. J., and from \$10.06 to \$10.29 per ton, New York or Brooklyn.

Old Material.—Prices of a few grades show a slight decline in a quiet market. No. 1 heavy melting steel is unchanged at \$13.50 per ton, delivered eastern Pennsylvania. Yard grade buying prices range from \$10.50 to \$11 per ton, delivered, with shipments going to Pottsville, Steelton and Conshohocken. Brokers show continued interest in export business and some small tonnages of heavy melting steel are being shipped to Japan, Italy and Germany.

an, italy and Germany.	
Dealers' buying prices per gross ton f.o.b. New	York:
No. 1 heavy melting steel \$10.00 to \$	
Heavy melting steel (yard) 6.75 to	7.25
No. 1 heavy breakable cast 11.25 to	12,00
No. 1 heavy breakable cast 11.25 to Stove plate (steel works) 7.25 to	7.75
Locomotive grate bars 8.00 to	8,50
Machine shop turnings 6.50 to	7.25
Short shoveling turnings 6.50 to	7.25
Cast borings (blast furnace or	
steel works) 6,25 to	7.25
Mixed borings and turnings 6.50 to	7.25
Steel car axles 15.00 to	15.50
Iron car axles 23.75 to 1	24.75
Iron and steel pipe (1 in. dia.,	
not under 2 ft. long) 7.75 to	8,25
Forge fire 6.75 to	7.00
	10,50
No. 1 yard wrought, long 8.50 to	9.00
	10.50
	11.25
	9.00
	10.00
	11.00
Prices per gross ton, delivered local foundries	
No. 1 machinery cast\$13.75 to \$	14,25
No. 1 heavy cast (columns, build-	
ing materials, etc.), cupola size 11.75 to	12.25
No. 2 east (radiators, cast boil-	
ers, etc.)	11.75

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	3.00c.
Reinforcing steel bars2.25	c. to 2.75c.
Cold-finished rounds and hexagons	3.65c.
Cold-finished flats and squares	4.15c.
Hoops and bands	3.65c.
Cold-finished strip	*5.95c.
Black sheets (No. 24)	3.75c.
Galvanized sheets (No. 24)4.40	c. to 4.50c.
Blue annealed sheets (No. 10)	3.25c.
No. 9 annealed wire, per 100 lb	\$2.90
No. 9 galvanized wire, per 100 lb	3.35
Common wire nails, base per keg	2.90

*Net base, including boxing and cutting to length.

Cleveland

Specifications from Automobile Industry Still Heavy—Sheets Continue Weak

CLEVELAND, May 8.—May has started out with a somewhat better volume of orders for steel bars, plates and structural material than the first week in April. However, early April orders were light because of the heavy specifications of late March. The demand is quite irregular, orders some days being fair and other days light. Consumers are ordering in small lots and nearly all business is in specifications against contracts. Orders for hot-rolled strip show a gain in this territory, as consumers are getting near the end of their stocks ordered at the end of the first quarter.

Specifications for steel bars, sheets and strip steel from the automotive industry continue at the recent good volume, but it is scarcely expected that the present demand from this source will be maintained many weeks longer, as there will probably be a seasonal slowing down of the automotive industry starting not later than July 1. Automobile manufacturers are not carrying large stocks, and consequently may not make much reduction in shipping orders before they cut down production schedules. With Ford production still rather low, other makers of low-priced cars may be able to maintain operations at a good rate through the summer.

Consuming industries in this territory outside of the automotive field show a slight gain in average operations over last month. In the building field, structural lettings are still rather light. With no large boats in prospect, the output for the lake shipbuilding industry this season is not very promising.

The price situation shows little change. Sheets and hot-rolled strip continue weak. Steel bars, plates and structural material are firm at 1.85c., Pittsburgh. Small undesirable lots are bringing 1.90c. Cleveland mills quote steel bars at 1.85c., mill.

Pig Iron.-Producers continue to sell a fair tonnage of foundry and malleable iron for early shipment or for the remainder of the quarter. The only noticeable change in the buying situation recently is an increase in small-lot orders. These are coming out not only from small consumers, but from some of the large-lot buyers who are following a hand-to-mouth buying pol-Only a few third quarter sales have been made. Lake furnace prices are well stabilized at recent levels, with a range of \$16.50 to \$17 for foundry and malleable iron, the lower price being rather common for delivery to competitive points. However, at least one Lake furnace is holding to a \$16.75 minimum. For Cleveland delivery and in Michigan, the price is unchanged at \$18, furnace. Valley furnaces appear to be holding to \$16.50 for basic iron. The offer of English low phosphorus iron at \$26, delivered Lake Erie ports, in direct water shipments from England has raised a question as to whether the anti-dumping clause of the tariff could not be invoked against bringing in this foreign However, the delivered price of \$26, duty paid, is said to be about equivalent to the \$23 price at which this iron has been offered delivered on the Eastern seaboard, the additional \$3 a ton charge covering the additional Lake and canal transportation charges.

Prices	per	gross	ton	at i	Cl	eve	lan	d:						
N'th	'n N	0. 2	fdy.,	sil.	1	.75	to	2	.25					\$18.50
														22.00
Mall	eabl	8										0.3		18.50
Onio	SHV	ery, a	per	cen	t.						0		0	28.00
														16.50 26.50

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; \$3 from Jackson, Ohio; \$6 from Birmingham.

Iron Ore.—First ore cargoes of the season are on the way down the Lakes, and it is expected that a good start will be made in shipments before the end of the week. However, some of the ore firms are in no hurry to get all their boats going and May shipments will probably be rather light. Only one cargo was shipped during April, this being 5946 tons sent from Escanaba to a nearby Michigan port. During April last year

over 1,500,000 tons of ore was shipped. There is very little activity in the ore market and no inquiries for large lots are pending.

Sheets.—While sheet prices do not appear to have gone any lower than those reported a week ago, the minimum quotations have become more general, indicating a somewhat weaker market situation. A Valley basing point is being freely used, giving buyers an additional advantage that in Cleveland amounts to about \$2 a ton. Black sheets are plentiful at 2.75c., Valley mill. On blue annealed sheets, 1.90c., Pittsburgh, and 2c., Valley, seem to be the minimum prices, with 2.05c., Valley, rather common. Galvanized sheets are available at 3.55c., Valley mill. Present minimum sheet prices are about \$2 a ton lower than those prevailing late last year, except on auto body sheets, which are holding steady to 4c., Pittsburgh. Specifications are fair against contracts, but new business is rather slow.

Strip Steel.—The hot-rolled strip market continues highly competitive on wide material, and some of the mills do not appear to be adhering to a regular base, the price being gaged by the amount of extras. On wide material, 1.80c., Pittsburgh, seems to be about the average price, with some quotations \$1 a ton higher and lower. Cold-rolled strip is unchanged at a minimum of 2.75c., Cleveland, for 3 tons and over. Some small-lot buyers are still paying 2.90c. to irregular sources of supply.

Wire Products.—The nail market shows a firmer tone in central Ohio, where \$2.60 per keg has become the more common quotation, or an advance of \$1 a keg. In northern Ohio, large buyers are still able to get concessions from \$2.65.

Reinforcing Bars.—The Cleveland Union Terminals Co. has placed 2500 tons and has another inquiry out estimated at 800 to 1000 tons. Small lots are in good demand. Rail steel bars are holding to 1.75c., mill.

Warehouse Business.—Sales are not holding up to recent volume. The demand for steel bars, plates and structural material is well scattered among consuming industries, but only moderate from any of them. Prices are firm. Galvanized sheets are moving better than recently, but the seasonal spring demand is not as good as expected. A leading jobber has reduced galvanized sheets \$2 a ton.

Old Material.—The market has a weak tone. Dealers anxious to move scrap sold No. 1 heavy melting steel at \$13.40 during the week, and a price above \$13.50 has about disappeared. Considerable scrap is backing up on dealers' books, and more material is coming on the market than mills are taking in. Drop forge flashings have declined 25c. a ton. Other prices are unchanged.

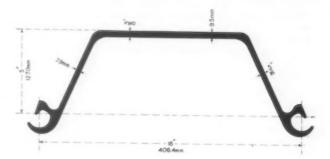
Prices per gross ton, delivered consumers' yards:

Basic Open-Hearth Gra	des		
No. 1 heavy melting steel	12.75 to 12.50 to 11.50 to 11.75 to 7.00 to 11.50 to 13.50 to 11.00 to 9.00 to	\$13.75 13.00 12.75 11.75 12.25 7.50 12.00 13.75 11.25 9.50 13.00	
Acid Open-Hearth Gra			
Low phosphorus forging crops Low phosphorus, billet, bloom and slab crops Low phosphorus sheet bar crops. Low phosphorus plate scrap	17.00 to 16.50 to	17.00 17.50 17.00 16.50	
Blast Furnace Grade	S		
Cast iron borings	9.25 to 9.25 to 9.25 to	9.50 9.50 9.50	
No. 1 cast	16.50 to	17.00	
Railroad grate bars Stove plate Rails under 3 ft. Miscellaneous	11.00 to 12.00 to 18.00 to	12.00 12.50 18.50	
Railroad malleable			
Rails for rolling	16.25 TO	16.50	

Bolts, Nuts and Rivets.—The demand for bolts and nuts is fairly good, the volume of orders being about the same as last month. Rivet specifications are moderate, and manufacturers are disappointed that there is no improvement in current orders, which are scarce.

New Section of Lackawanna Piling

Bethlehem Steel Co. has added a deep-arch type section to its line of Lackawanna steel sheet piling. This form, designated as Section DP165, is characterized by the depth and shape of its arch construction. The chief particulars of the new section are: Nominal width, 16 in.; depth, 5 in.; thickness of web, % in.; weight per



Depth of Arch Construction Characterizes New Lackawanna Sheet Steel Piling

foot of pile, 33.3 lb.; weight per square foot of wall, 25 lb.; section modulus per foot of wall, single, 10.07; interlocked, 16.14.

This new section is adapted for general use in types of construction where strength and light weight are of importance, and where the piling is to be used permanently, such as in the case of bulkheads, docks, retaining walls, wharves and similar structures. The interlock is of the double-lock type, already a feature of Lackawanna piling.

Early Rolling of Sheets

At the meeting of the metal branch of the National Hardware Association at Boston last week, C. F. Ahlbrandt, general manager of sales American Rolling Mill Co., Middletown, Ohio, discussed the rolling of sheets. The following is taken from his paper:

The first mention of rolling sheets seems to be in the work of Christopher Polhem, a Swedish mechanical genius, whose book, printed in 1761, ten years after his death, speaks of mills rolling both plates and bar iron. In chapter 14 he says: "Much time and labor can be saved by good rolling mills, because the rolling mill can produce 10 to 20 and still more bars in the same time required to upset one bar with a hammer."

After mentioning the economic difficulties which prevented him from using his mill, Mr. Polhem concluded: "Yet I willingly grant to others who will perhaps live during more happy times, what I have not had the opportunity to use myself." Concurrently, practical developments were being made in Wales. It was about 1750 that the Welsh tin plate business developed into a real industry, and rolling became the standard method of sheet manufacture.

You frequently hear the statement that the sheet rolling process is antiquated and has not been improved in the past 150 years. Before the opening of the present century, black and galvanized sheets and tin plate constituted practically the entire production of the world's sheet mills. How different it is today, with furniture sheets, electrical sheets, enameling sheets—products with surface refinements, drawing properties, analysis and performance possibilities undreamed of only a few decades ago. The production of all of these has meant tremendous pioneering effort in the manufacturing processes.

Now comes the continuous method of rolling, which worked an entire revolution in the old system. Though public attention was not focused on this development until last year, the Ashland, Ky., unit of the American Rolling Mill Co. has been producing sheets by the continuous process since 1923.

The nature of the work made a small experimental unit impossible. Millions of dollars had to be put into the plant before it could be definitely determined whether the principles were sound and practicable.

San Francisco

Reinforcing Steel Awards Large—Prices Firm Except on Sheets

SAN FRANCISCO, May 5, (By Air Mail).—Movement of iron and steel products on the Pacific Coast during the past week showed little improvement over the previous week. The most active commodity was reinforcing steel, and several fair-sized awards were reported. Cast iron pipe inquiries have increased, but business booked did not exceed 1000 tons. The price structure is on a fairly firm basis in most lines, although low quotations continue on reinforcing bars out-of-stock in the San Francisco district.

Pig Iron.—During the past week more than 1400 tons of Indian foundry iron were imported. Most of it was taken by San Francisco and Los Angeles users, but several hundred tons went to Seattle and Portland. The next shipment, 1500 tons, is scheduled to arrive on the Coast in early June and will be distributed among Los Angeles and San Francisco melters. Prices are unchanged.

Prices per gross ton at San Francisco.

*Delivered San Francisco,
**Duty paid, f.o.b. cars San Francisco.

Bars.—Reinforcing steel bar awards reported this week included 2000 tons for the Bon Marche Store at Seattle, divided between the Pacific Coast Steel Co. and the Northwest Steel Rolling Mills; 400 tons for the Kezar Stadium in San Francisco, placed with Gunn, Carle & Co., and 400 tons for foundations for the Capwell Store, Oakland, awarded to a San Francisco jobber. Pending business involves lots of less than 100 tons each. In the Bay district less than 2c. per lb. continues to be quoted in many instances.

Plates.—Plate business this week was in small lots. No action has yet been taken on 8000 tons for the Sequoia and Wildcat aqueducts, but a definite decision regarding the type of pipe to be used will no doubt be announced within a few days. Bids are in on 700 tons for a car float for the Santa Fe, and the Western Pacific will come into the market shortly for a similar float. Bids have been opened on a pipe line at Tacoma, calling for 120 tons. An inquiry is before plate mill representatives for 500 tons of 3/16 and ½-in. material. The price is firm at 2.30c., c.i.f.

Shapes.—While structural shape awards were not numerous this week, totaling less than 1600 tons, new and pending inquiries call for close to 16,000 tons. The California Steel Co. took 380 tons for a warehouse in Oakland for the Port Commission. A bridge over the San Joaquin River at Herndon, Cal., calling for 1000 tons, went to the United States Steel Products Co. Bids were opened on 1125 tons for a bridge over the Columbia River at Kettle Falls, Wash. Other inquiries include 800 to 1000 tons for the West Waterway bridge in Seattle, 1500 tons for a pulp plant at Astoria, Ore., and 250 tons for an apartment building in Los Angeles. Plain material continues firm at 2.35c., c.i.f.

Cast Iron Pipe.—Improvement in demand for cast iron pipe is noted. Awards include 234 tons of 4 and 8-in. class B for the Miller Cattle Co., Phoenix, Ariz., booked by O. F. Fisher of the same city, and 111 tons of 6 and 12-in. class B for a sewer project at Long Beach, Cal., awarded to C. Anill Co., Huntington Park, Cal. Bids were opened this week on 152 tons of 2 to

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes	3.15c.
Soft steel bars	
Small angles under 3-in	3.55c.
Small channels and tees, %-in. to 2%-in Spring steel, ¼-in. and thicker	1 3.75c. 5.00c.
Black sheets (No. 24)	4.95c.
Blue annealed sheets (No. 10) Galvanized sheets (No. 24)	
Structural rivets, 1/2-in. and larger	
Common wire nails, base per keg	

8-in. class B for Camas, Wash. On May 14, Lovelock, Nev., will open bids on 887 tons of 10 to 14-in. class 150. Los Angeles will open bids on May 11 for 1665 tons of 6-in. class B, and Pasadena, Cal., will receive bids on May 12 for 417 tons of 6 and 8-in. classes C and B. South Vancouver, B. C., has opened bids on 113 tons of 4 to 8-in. class B. Bids will be opened on May 21 for 131 tons of 10 and 14-in. class B pipe for a sewer project in Pacific Beach, San Diego, Cal.

Sheets.—Prices on black and galvanized sheets have weakened somewhat, reflecting the softness in Eastern centers. Demand is limited to unimportant tonnages. The Kittle Mfg. Co., Los Angeles, has been awarded the contract for the Texas license plates for 1929, requiring about 400 tons of black sheets.

Coke.—A shipment of 4500 tons of English byproduct and beehive foundry coke has arrived on the Coast and part of the cargo is now being unloaded at Los Angeles, the rest to be delivered to San Francisco melters. Prices are unchanged.

St. Louis

Expansion in Pig Iron Sales—Higher Prices on Some Scrap Items

St. Louis. May 8.—Pig iron sales showed considerable improvement over the preceding week. The St. Louis Gas & Coke Corporation sold about 4500 tons, some for shipment into third quarter, including lots of 500 and 300 tons to two Iowa melters, 200 tons to a St. Louis stove foundry, and the remainder in scattered lots of a carload up to 200 tons. A leading Southern interest sold 1050 tons for May and June delivery. Shipments of the Granite City producer for April equaled March shipments, and were slightly better than those in April, 1927. The melt in the district is improving, but the stove plants report business is quiet. Prices are unchanged.

 Prices per gross ton at St. Louis:
 No. 2 fdy., sil. 1.75 to 2.25, f.o.b.
 \$19.00

 Granite City, Ill.
 \$19.00

 Northern No. 2 fdy., delivered
 20.66

 St. Louis
 20.42

 Northern No. 2 fdy., delivered
 \$19.92 to 20.42

 Northern malleable, delivered
 20.66

 Northern basic, delivered
 20.66

Freight rates: 81c. from Granite City to St. Louis; \$2.16 from Chicago; \$4.42 from Birmingham.

Coke.—Business in domestic coke during April was fairly good, dealers taking in heavier stocks than had been expected. Buying of foundry grades is quiet.

Finished Iron and Steel.—Blue annealed sheets are in good demand; tank plate buying is heavy, with prices improving, and there is a good demand for tin plate, according to the Granite City Steel Co. However, the situation as to galvanized sheets is not so good, buying from the agricultural districts not being up to expectations, and there is some price cutting. April warehouse business is about the same as in the preceding month, but about 10 per cent less than in April, 1927; the greatest loss comes from the oil-producing sections, buying in the St. Louis industrial district proper being

Warehouse Prices, f.o.b. St. Louis

Base per Li	D.
Plates and structural shapes 3.25c.	
Tank rivets, 76-in. and smaller, 100 lb. or more	
Machine bolts. 60 Carriage bolts 60 Lag screws 60 Hot-pressed nuts, squares, blank or tapped.	
200 lb. or more	
200 lb. or more	

fairly good. Business is extremely dull with fabricators of structural steel, and there is complaint that prices are too low on the little trade that is available. About 600 tons of reinforcing steel was bought during the week.

Old Material.—Miscellaneous standard-section rails, railroad springs and cast iron borings were 25c. a ton higher, and cast iron car wheels were 50c. higher during the week, dealers paying more to obtain material to cover contracts. A higher market is expected on No. 1 busheling, as the result of more exacting specifications issued by the leading consumer in the district. It is expected that this also will cause higher prices to rule for shoveling steel. Railroad lists: Wabash, 2900 tons; Southern Pacific, 2800 tons; Kansas City Southern, 2400 tons; Chicago & Eastern Illinois, 450 tons.

Prices per gross ton, f.o.b. dealers' yards and delivered St. Louis district consumers' works:

Heavy shoveling steel	11 50 to	12 00	
Miscellaneous standard - section	22.00 00	20.00	
rails including from emitches			
and guards out agent	10 75 4-	19.05	
Dailnes d application	12.70 0		
Railroad springs			
No. 1 busheling	9.50 to		
Cast iron borings	9.00 to	9.25	
Iron rails	13.00 to	13.50	
Rails for rolling			
Machine shon turnings			
Steel angle bars			
Cast iron carwheels			
No. 1 machinery cast	13.00 to	13.50	
Railroad malleable	11,00 to	11.50	
No. 1 railroad cast	13.50 to	14.00	
Relaying rans, 10 lb. and over	20.00 (0	28.00	
	No. 1 locomotive tires. Heavy shoveling steel. Miscellaneous standard section rails, including frogs, switches and guards, cut apart. Railroad springs Bundled sheets No. 2 railroad wrought. No. 1 busheling Cast iron borings Iron rails Rails for rolling. Machine shop turnings Steel car axles Iron car axles Wrought iron bars and transoms. No. 1 railroad wrought. Steel rails, less than 3 ft. Steel angle bars Cast iron carwheels No. 1 machinery cast Railroad malleable No. 1 railroad cast Stove plate Agricultural malleable Relaying rails, 60 lb, and under.	No. 1 locomotive tires 12.00 to	rails, including frogs, switches and guards, cut apart. 12.75 to 13.25 Railroad springs 13.75 to 14.25 Bundled sheets 8.75 to 19.25 No. 2 railroad wrought 11.50 to 12.00 No. 1 busheling 9.50 to 10.00 Cast iron borings 9.00 to 9.25 Iron rails 13.00 to 13.50 Machine shop turnings 7.00 to 7.50 Steel car axles 17.50 to 18.00 Iron car axles 23.50 to 24.00 Wrought iron bars and transoms 21.00 to 21.50 No. 1 railroad wrought 10.00 to 10.50 Steel angle bars 12.00 to 12.50 Cast iron carwheels 13.50 to 14.00 No. 1 machinery cast 13.50 to 14.00 No. 1 railroad cast 13.50 to 14.00 Stove plate 12.00 to 12.50 Railroad malleable 12.00 to 12.50 Railroad malleable 12.00 to 12.50 Agricultural malleable 12.00 to 12.50 Relaying rails, 60 lb, and under 20.50 to 23.50

Canada

Steel Mill Operations Continue at High Rate—Pig Iron Weak

Toronto, Ont., May 8.—The near-capacity operations that have featured activities of Canadian steel mills and various iron and steel consuming lines show no signs of declining. Most companies have a large volume of unfilled orders on their books and report a steady flow of new business. The Canadian National Railways have distributed the following orders among Canadian companies: To Canadian Car & Foundry Co., five cafe-parlor cars, two library observation buffet cars, 60 Hart-Otis ballast cars, and 30 colonist cars; to National Steel Car Corporation, Ltd., 12 box baggage cars, and 20 colonist cars; Eastern Car Co., 200 Hart-Otis ballast cars, and 12 steel drop-nose snow plows.

Pig Iron.—Conditions and activities in the market remain practically unchanged for the week. While no forward buying of importance is reported, a steady flow of shipping orders against contracts is appearing, which, together with the current demand on spot delivery account, is responsible for a large movement of foundry and malleable iron. Present sales are being made to hand-to-mouth consumers, who prefer to buy in this way rather than lay in large yard stocks. Spot sales of the week averaged between 50 and 200 tons. A couple of inquiries are out for as high as 500 tons, and these tonnages are to be delivered over water routes. Now that Great Lakes and St. Lawrence navigation has opened, pig iron interests look for larger tonnage placements by melters who are advantageously situated for water delivery. Prices are unchanged.

Prices per gross ton:

rices per gross ton:	
Delivered Toronto	
No. 1 foundry, sil. 2.25 to 2.75\$23.10 to \$ No. 2 foundry, sil. 1.75 to 2.25 23.10 to Malleable	23.60
Delivered Montreal	
No. 1 foundry, sil. 2.25 to 2.75 24.50 to No. 2 foundry, sil. 1.75 to 2.25 24.50 to Malleable	25.00
Imported Iron at Montreal Warehouse	
Summerlee Carron	33.50 33.00

Old Material.—While general business is without special feature, current sales are reported at a good level. The market is spotty in some respects, showing general improvement for a couple of days in the week when several consumers came into the market for supplies for immediate needs. Advance buying is not an issue in the present market. Prices are unchanged.

Dealers' buying prices: Per Gross Ton

	Toronto	Montreal
Heavy melting steel	\$9.00	\$8.00
Rails, scrap	10.00	10.00
No. 1 wrought	9.00	11.00
Machine shop turnings	7.00	6.00
Boiler plate	7.00	7.00
Heavy axle turnings	7.50	7.50
Cast borings	7.50	6.00
Steel turnings	7.00	6.50
Wrought pipe	5.00	6.00
Steel axles	14.00	19.00
Axles, wrought iron	16.00	21.00
No. 1 machinery cast		16.00
Stove plate		12.00
Standard carwheels		14.50
Malleable		13.00
Per Net Ton		
No. 1 machinery cast	15.00	
Stove plate	9.00	4441
Standard carwheels	13.00	
Malleable scrap	13.00	

Birmingham

Plates, Shapes and Bars in Good Demand —Pig Iron Quiet

BIRMINGHAM, May 8.—The quiet selling under way for the past several weeks is still the outstanding characteristic of the pig iron market. Purchases are largely for immediate needs and a considerable portion of June iron is yet to be sold. Books have not been opened for third quarter. Foundries are taking shipments against contracts at a steady rate, and very little iron is being stocked. On some of the larger lots of foundry iron recently sold, furnaces have gone to \$15.50, a reduction of 50c. a ton, but the usual quotation on small lots is \$16, base. Seventeen furnaces continue in operation, 10 on foundry, five on basic, one on recarburizing iron and one on ferromanganese.

Prices per gross ton, f.o.b. Birmingham district furnaces:

No. 2 foundry, 1.75 to 2.25 sil....\$15.50 to \$16.00

No. 1 foundry, 2.25 to 2.75 sil.... 16.00 to 16.50

Finished Steel.-Orders and inquiries for bars, plates and shapes continue to hold close to the recent volume. Prices are substantially unchanged, though some variations from present quotations are made from time to time on the larger orders. New business in sheets is in reduced volume. Railroads have placed a fair volume of new business recently. New business with the structural steel fabricators shows improvement. The Virginia Bridge & Iron Co. has an order for 1800 tons for underframes for the Frisco System. The Ingalls Iron Works has received three orders totaling 380 tons. Reinforcing bar manufacturers are receiving sufficient tonnage to round out shop schedules. The Connors Steel Co. booked a 350-ton order for a Government building at Fort Bennings, Ga. hearth operations have been the same during the past two weeks with the Tennessee company operating seven at Ensley and four at Fairfield, and the Gulf States Steel Co. four at Alabama City.

Cast Iron Pipe.—Pressure pipe manufacturers obtained a moderate amount of new business in small orders during the week. Public utility buying has not developed to the extent expected. Local plants hope to share in a few of the orders to be placed by municipalities. Bids are to be opened this week on good-sized tonnages for Knoxville, Tenn., Greer, S. C., and Summerville, S. C. Inquiries show marked increase. Prices have advanced \$2 a ton, and quotations are now being made at \$31 to \$33. Soil pipe makers are finding business fair. Shipments have increased slightly.

Coke.—Sales have been on a spot basis for some time owing to previous purchases by all of the important consumers. No change in the volume of current business is noted. Shipments of foundry coke on second quarter contracts are being made at fair rate. Quotations remain at \$5.

Old Material.—The recent improvement in No. 1 machinery cast and steel scrap trading failed to carry forward into the past week. Both sales and demand are low in all lines. The quotation on above plate has dropped to \$13.50. Other prices are the same.

Prices per gross ton, delivered Birmingham district

onounters guras.		
Heavy melting steel Scrap steel rails	\$9.50 to	\$10.00
Short shoveling turnings	8.00 to	8.50
Cast iron borings		8.00
Stove plate		
Steel axles	19.00 to	20.00
Iron axles	20.00 to	21.00
No. 1 railroad wrought		
Rails for rolling	20.00 20	13.00
No. 1 cast		14.50
No. 1 cast		14.00
Tramcar wheels	12.50 to	13.50
Cast iron carwheels	12.00 to	13,00
Clear iven heniums chemiani	19 50 00	1100

Boston

Pig Iron Sales 8000 Tons, Mostly at \$16, Buffalo—Scrap Prices Easier

Boston, May 8.—Pig iron sales the past week were nearly twice as large as in the previous week, running close to 8000 tons, including 4500 tons of Mystic iron and 1200 tons of Buffalo iron and some from Alabama, eastern New York and western Pennsylvania. Mystic sales included one lot of 3000 tons, and a Buffalo furnace sold 800 tons of No. 2X. A small amount of Indian iron, mostly No. 2X, at \$21.75 and \$22 on dock here, duty paid, was sold. Some sales were for prompt shipment, but most of them were for deliveries running into third quarter. Prices remain low, with Mystic, eastern New York State and Buffalo irons selling on a basis of \$16 a ton, base Buffalo. Foundries with iron contracted for are taking it on schedule, and a few instances are cited where shipments are taken and a few instances are cited where shipments are taken quarter will be larger than expected a month ago. The New England melt increased quite noticeably during April and so far this month has shown a further gain.

Prices of foundry iron per gross ton, delivered to

MARC TACK	Eng	uana	poi	nts:					
Buffalo,	sil.	1.75	to	2.25	 		\$20.91	to	\$21.91
Buffalo.									
East. Pe									
East. Pe									
Virginia	, sil.	1.75	to	2.25					25.71
Virginia	, sil.	2.25	to	2.75		- 4			26.21
Alabama	t, sil	. 1.75	10	2.25			22.41	to	24.27
Alabama	t, sil	. 2.25	to	2.75			22.91	to	24.77

Freight rates: \$4.91 from Buffalo, \$3.65 from eastern Pennsylvania, \$5.21 all rail from Virginia, \$6.91 to \$8.77 from Alabama.

Iron Importations.—April receipts of foreign iron at this port totaled 1322 tons, compared with 558 tons in March, this year, 110 tons in April, 1927, 6332 tons in

Warehouse Prices, f.o.b. Boston

Base per Lb.

4.211	the free rates
Plates	3.365c.
Structural shapes—	
Angles and beams Tees Zees Soft steel bars and small shapes Flats, hot-rolled. Reinforcing bars 3.265c. to	3.365c. 3.465c. 3.265c. 4.15c.
Iron bars—	
Refined Besterefined Norway, rounds Norway, squares and flats	4.60c. 6.60c.
Spring steel—	
Open-hearth 5.00c. to Crucible	12,00c. 0 4.75c. 0 5.00c.
Cold rolled steel-	
Rounds and hexagons. *3.45c. to Squares and flats *3.95c. to Toe calk steel Rivets, structural or boiler	6.95c. 6.00c. 4.50c.
Per Ce	ent off List
Machine bolts 5 Carriage bolts 5 Lag screws 5 Hot-pressed nuts 5 Cold-punched nuts 5 Stove bolts 70	0 and 5 0 and 5 0 and 5 0 and 5

April, 1926, and 6167 tons in April, 1925. The April importations were made up of 997 tons of Indian iron and 335 tons of Dutch. Importers intimate that receipts of Indian iron from now on will be increased.

Coke.—Not much increase has occurred in the movement of by-product foundry coke from ovens to foundries. The movement, however, is no indication of the iron melt, because foundries are drawing on supplies taken in the last of 1927 and in March, this year. Foundry fuel is selling at \$11 a ton, delivered within a \$3.10 freight rate zone. Dealers are stocking up heavily with domestic coke; consequently ovens in New England for the first time this year are not increasing their storage piles.

Cold-Rolled Strip.—Little cold-rolled strip steel tonnage is coming into the market. Business is being taken on a basis of 3.15c. to 3.30c., base Worcester, Mass., for 1 to 3 ton lots.

Bars.—Mills report some slackening in buying of bars, but specifications against contracts are liberal. The market for bars is firm at 1.90c. per lb., base Pittsburgh. Orders for reinforcing steel are usually for small tonnages, yet the weekly turnover in New England runs into several thousand tons. The mill price remains at 1.90c. per lb., base Pittsburgh, but out-of-stock prices are irregular.

Old Material.—The old material market has lapsed into dullness. A little heavy melting steel for Pennsylvania delivery was bought in the past week at \$9 to \$9.25 a ton on cars, shipping point, indicating a slight easing in prices. Car lots of steel turnings, mixed borings and turnings, forged scrap, T rails and miscellaneous other materials have been moved, generally at inside quotations. Most shippers have completed their Pennsylvania orders for textile and machinery cast, and the turnover the past week was smaller than it has been in some time. On May 8 there was an auction sale of surplus materials at the Navy Yard, Boston, including 2,000,000 lb. of ferrous metals, 360,000 lb. of nonferrous metals, 30,000 lb. of copper wire, 25,000 lb. of cable, and 150,000 lb. of black and galvanized heavy and light iron and steel.

Buying prices per gross ton f.o.b. Boston rate ship-

ping points:		
No. 1 heavy melting steel	\$9.00 to	\$9.25
Scrap T rails	8.50 to	9.00
Scrap girder rails	7.50 to	8.00
No. 1 railroad wrought	10.00 to	10.25
No. 1 yard wrought	7.50 to	8.00
Machine shop turnings	5,50 to	6.00
Cast iron borings (steel works		
and rolling mill)	6.00 to	6.25
Bundled skeleton, long	5.75 to	6.25
Forge flashings	6.60 to	7.25
Blast furnace borings and turn-		
ings	5.75 to	
Forge scrap	6.00 to	6.25
Shafting	13.00 to	
Steel car axles	15.50 to	16.00
Wrought pipe (1 in. in diameter,		
over 2 ft. long)	7.50 to	
Rails for rolling	10.00 to	
Cast iron borings, chemical	9.50 to	10.00
Prices per gross ton delivered cons	umers'	yards:
Textile cast	\$13.50 to	\$14.00
No. 1 machinery cast	15.25 to	15.50
No. 2 machinery cast	13.50 to	14.00
Stove plate	10.00 to	10.50

Warehouse Prices, f.o.b. Cincinnati

Base per Lb.
Plates and structural shapes 3.40c. Bars, soft steel or iron 3.30c. New billet reinforcing bars 3.15c. Rail steel reinforcing bars 3.00c. Hoops 4.00c. to 4.25c. Bands 3.95c. Cold-finished rounds and hexagons 3.85c Squares 4.35c Black sheets (No. 24) 4.90c. Galvanized sheets (No. 24) 4.90c. Blue annealed sheets (No. 10) 3.60c. Structural rivets 3.85c. Small rivets 65 per cent off list No. 9 annealed wire, per 100 lb \$3.00 Common wire nails, base per keg 2.95 Cement coated nails, base 100 lb. keg 2.95 Chain, per 100 lb 7.55
Net per 100 Ft.

*Including quantity differentials.

Cincinnati

Southern Iron Off 50c.—Cast and Malleable Scrap Declines

CINCINNATI, May 8 .- With substantial tonnages of pig iron on the yards of Southern producers, prices in the South are sagging, with the result that quotations have been made at \$15.50, base Birmingham, a drop of 50c. a ton from the previous schedule. This puts Southern iron into Cincinnati at the lowest delivered price since October, 1916. In fact, it gives Southern furnaces a differential of 19c. a ton over northern Ohio interests, figuring quotations of the latter at \$16.50, base furnace. Just how important the decrease will be in broadening sales in the district adjacent to and north of the Ohio River depends considerably upon whether Lake Erie producers will see fit to dip under \$16.50 to obtain orders at such points as Louisville and Evansville. Undoubtedly Southern makers will have an advantage. Southern Ohio foundry iron remains nominally at \$19, base Ironton. A local dealer has sold 7000 tons of foundry iron. The Ford Motor Co. is inquiring for 400 tons of 14 to 16 per cent ferro-silicon and the Andrews Steel Co. is in the market for 100 to 200 tons of ferromanganese.

Prices per gross ton, delivered Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25... \$20.89
So. Ohio malleable.......\$20.14 to 20.89
Alabama fdy., sil. 1.75 to 2.25... 19.19 to 19.69
Alabama fdy., sil. 2.25 to 2.75... 19.69 to 20.19
Tennessee fdy., sil. 1.75 to 2.25... 19.19 to 19.69
Southern Ohio silvery, 8 per cent 26.89

Freight rates, \$1.89 from Ironton and Jackson, Ohio; \$3.69 from Birmingham.

Finished Material .- Mills are having difficulty in obtaining orders and specifications in sufficient volume to sustain operations at the current rate. Especially in bars, structural shapes and plates is demand lagging, although these heavy steel products are firm at 1.85c., base Pittsburgh, for contract tonnages and at 1.90c. for small miscellaneous lots. Fabricators report that considerable work is about to come out, but jobs actually being figured are few in number. The only major project calls for 725 tons of steel for four hangars at Wright Flying Field, Dayton, Ohio. Orders for sheets have been received at a moderate rate by district mills, sales having been well distributed among all consuming lines. While there has been a slight letdown in specifications from the automotive industry, bookings from that source still are in impressive proportions. sheets are bringing 2.75c. to 2.85c., base Pittsburgh, galvanized stock, 3.65c. to 3.75c., automobile body sheets, 4c., and blue annealed, 2c. to 2.10c. Production of sheet companies in this district has been well sustained in the past week and no change is contemplated in the next week. Wire goods are rather quiet, with interest centering mostly in common wire nails, which are quoted at \$2.50 to \$2.55 per keg, base Ironton, with a barge rate of 14c. to this city. That there has been considerable irregularity in prices of nails is the report from producers. Makers of standard steel pipe declare that shipments to consumers in this territory have been exceptionally good, while sales of tin plate also have been brisk.

Reinforcing Bars.—New billet bars are firm at 1.85c., base Pittsburgh, and rail steel stock at 1.80c., base mill.

Warehouse Business.—Several important jobbers state that sales in the first week of May showed considerable improvement. Quotations on all items are steady and unchanged.

Coke.—Specifications and orders for by-product foundry coke have been in about the same volume as in the last week of April, while domestic grades still are in moderate demand for dealers' stocks. Shipments of beehive foundry coke from the Wise County and New River districts have been only fair. A central Indiana steel company is expected to buy 8000 tons of by-product furnace coke.

Foundry coke prices per net ton, delivered Cincinnati: By-product coke, \$9.02; Wise County coke, \$7.09 to \$7.59; New River coke, \$9.09 to \$9.59. Freight rates, \$2.14 from Ashland, Ky.; \$2.59 from Wise County and New River ovens.

Old Material.—There is perceptible weakness in the scrap market, cast iron and malleable iron grades having declined 25c. to 50c. a ton. Movement of material to district steel plants is slightly lower in volume. Dealers report that they are having less difficulty in buying scrap which some consumers have been holding in the hope of getting higher prices. Railroad lists closing this week are: Louisville & Nashville, Norfolk & Western, Southern and Chesapeake & Ohio.

Dealers' buying prices per gross ton f.o.b. cars, Cincinnati:

Heavy malting steel ett 00 to 8	111 50
Heavy melting steel \$11.00 to \$	
	11.75
Loose sheet clippings 8.25 to	8.75
Bundled sheets 9.25 to	9.75
Cast iron borings 8.00 to	8.50
Machine shop turnings 7.50 to	8.00
No. 1 busheling 10.00 to	10.50
No. 2 busheling 7.00 to	7.50
Rails for rolling 12.50 to	13.00
No. 1 locomotive tires 12.75 to	13.25
No. 1 railroad wrought 10.00 to	10.50
Short rails 15.75 to	16.25
Cast iron carwheels 12.25 to	12.75
No. 1 machinery cast 15.25 to	15.75
No. 1 railroad cast 12.75 to	13.25
Burnt cast 7.50 to	8.00
Stove plate 8.25 to	8.75
Brake shoes 9.50 to	10.25
Railroad malleable 11.50 to	12.00
Agricultural malleable 11.00 to	11.50

Buffalo

Detroit Scrap Again Moving to Buffalo by Boat—Pig Iron Melt High

Buffalo, May 8.—Orders for pig iron placed during the week were small in number and tonnage. Practically all of them were 100-ton lots of foundry and malleable, with a few 200-ton lots, and the remainder carloads. Inquiry was light, the one outstanding being that of the Central Foundry Co. for Dundalk, Md., for an indefinite tonnage for the third quarter. The melt throughout the East, according to furnacemen, is increasing; shipments in April were larger than during March.

 Prices per gross ton, f.o.b. furnace:
 \$17.00

 No. 2 plain fdy., sil. 1.75 to 2.25
 \$17.00

 No. 2 foundry, sil. 2.25 to 2.75
 17.50

 No. 1X foundry, sil. 2.75 to 3.25
 18.50

 Malleable, sil. up to 2.25
 17.50

 Basic
 \$16.50 to 17.00

 Lake Superior charcoal
 27.28

Finished Iron and Steel.—Operations continue at approximately the same percentage as in recent weeks. Prices for bars, shapes and plates are firm and the demand is fair. Sheet demand continues good, especially for automobile body and metal furniture sheets. Bolt and nut specifications are holding to a high level. Fabricated structural business is exceptionally quiet. Reinforcing bar ordering had an off-week; only small lots were placed.

Old Material.—The market seems to have weaker tendencies. A mill which last week was reported to have taken 1000 tons of No. 1 heavy melting steel at \$14.75 is said to have bought an additional lot of about 1000 tons at this figure. The first shipment of scrap from Detroit was made by boat during the week. One of the local mills, which is said to have purchased about 60,000 tons of hydraulic compressed sheets and flashings last year, has received a shipment of between 3500 and 5000 tons of this material. Scrap shipments have been temporarily suspended by one of the prin-

Warehouse Prices, f.o.b. Buffalo

in dictionate a riceal riving andian	811.00
	Base per Lb
Plates and structural shapes	
Soft steel bars	2.75c.
Cold-finished flats, squares and hexagor	ns. 4.45c.
Rounds	5.85c.
Black sheets (No. 24)	4.30c.
Galvanized sheets (No. 24)	3.80c.
Common wire nails, base per keg	\$3.65
Black wire, base per 100 lb	3.90

cipal consumers contributing to the dullness of the market.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Gra No. 1 heavy melting steel	14.50 to 12.75 to 13.75 to 13.00 to 9.00 to 12.00 to 13.25 to 12.50 to 8.25 to	\$15.00 13.25 14.25 13.50 9.50 12.50 13.75 12.75 8.75
Acid Open-Hearth Grad	les	
Railroad knuckles and couplers Railroad coil and leaf springs Rolled steel wheels Low phosphorus billet and bloom	15.50 to 15.50 to 15.50 to	16.00 16.00 16.00
ends	17.00 to	17.50
Electric Furnace Grad	les	
Heavy steel axle turnings Short shoveling steel turnings	12.75 to 10.75 to	$\frac{13.25}{11.25}$
Blast Furnace Grade	28	
Short shoveling steel turnings Short mixed borings and turnings Cast iron borings No. 2 busheling	10.50 to 9.50 to 9.75 to 9.00 to	11.00 10.00 10.25 9.50
Rolling Mill Grades	5	
Steel car axles	17.00 to 22.00 to 12.50 to	17.50 23.00 13.00
Cupola Grades		
No. 1 machinery cast Stove plate Locomotive grate bars Steel rails, 3 ft. and under Cast iron carwheels	14.50 to 13.50 to 12.00 to 16.50 to 13.00 to	15.00 13.75 12.50 17.00 13.50
Malleable Grades		
Railroad Agricultural Industrial	15.00 to 15.00 to 15.00 to	$\begin{array}{c} 15.25 \\ 15.25 \\ 15.25 \end{array}$

Detroit

High Rate of Automobile Output Assured Until After June 1

DETROIT, May 8 .- The feeling in the automotive industry seems to be that there is no apparent letup in the record breaking production schedules attained in the first four months of this year. In any event, present operations will prevail until after June 1. whole, production is still climbing, in spite of the fact that March totals in a few instances have not been

equaled during the month just closed.

Buick is still running about 800 units per day. Cadillac and La Salle lines combined showed an April production of approximately 3300 units, or 647 better than the same month a year ago. This April figure, however, is 1200 units less than that for the previous Production for the first four months of 1928, month. at 14,184 units, showed an increase of about 46 per cent over that for the same period of 1927. Production is about equally divided between the two cars.

Chevrolet had an April production in excess of 132,-000 cars and trucks, or practically the same as for March. April, 1927, production ran only 111,937. The first four months of 1928 show a total of approximately 474,000, against 379,330 for the same period in 1927.

Dodge Brothers turned out 22,533 units during the month just passed, or 8261 better than April, 1927. During the first four months of the year, Dodge production reached 82,943 units, against 60,838 for 1927,

or a gain of 22,105 units.

Ford Motor Co. is producing model A cars at the rate of about 2300 per day, or about 300 more per day than reported last month. Edsel Ford states that by advancing production schedules a rate of 5000 units per day by July is aimed at. Thus far approximately 100,-000 units have been turned out and unfilled orders run

somewhere between 800,000 and 900,000.

During the past week the total production so far this year for Graham-Paige passed the entire total for 1927, which amounted to 28,881 units. The April figure is 8275, showing a gain of 5445 over that of April. 1927. During the first four months of 1928 21,407 units were produced, or nearly two and one-half times the 1927 figure for the same period, which was 8783. The Graham-Paige Motors Corporation has passed an appropriation to increase its capacity by one-third. The added facilities should be completed by July 1.

Hudson-Essex produced better than 28,000 units

during April, bringing the total for the first four months to approximately 120,000 units. April figures, approximately 7700, are below those for March, and show a slight daily decline, even when allowance is made for the two extra working days in March. May schedule has been set in advance of 28,000.

The Hupp Motor Car Co.'s April production of 8082 showed an increase of 3971 units over that for April, 1927. It was also better by 48 units than the figure for March of this year. During the first four months of the current year 24,952 units were produced, an increase of 9037 units over the same period in 1927.

April showed a production of 27,061 for Oakland and Pontiac cars, a decrease of 485 cars from the March production, but an increase of 7135 over April, 1927. Production for the first four months of this year amount to 100,004 units, or nearly twice that for the same period of 1927, which accounted for only 54,-653. It is understood that the entire schedule for 1928 contemplates an increase of 40 per cent over 1927.

A new record was established during the past month for the Olds Motor Works, when 11,089 units were completed, contrasted with 9142 for March and 6000 for April a year ago. This company entered May with 7500 unfilled orders, and has tentatively set a schedule of 12,000 units for the current month.

Packard ran six units ahead of March, with an April production of 4434 units, which is better than twice the 1927 figure for the same month. The first quarter production for Packard ran 12,999 units, as

against 6250 for 1927.

Reo turned out 5277 units in April, or an increase of 2028 over the previous month, but not equal to the 1927 mark for April, which stands at 5519. 6430 unfilled orders on the books May 1, and has set a production schedule for May of between 7500 and 8000 units, which if it is attained will far surpass

production for May, 1927, which ran 5545.

April showed a total of 14,500 Studebakers completed. This is an increase of 1600 units over April, 1927, but a decrease of 2000 from the March figure of 16,500. During the first four months of this year 50,000 units were produced, while in the same period

of 1927 only 43,000 were turned out.

Murray Corporation has booked approximately \$7,-000,000 worth of orders for Hupp Motor Car Co.

Auto body sheet is firm at 4c., Pittsburgh. Blue annealed is quoted at 2c., Pittsburgh. There is no change in cold finished bars and shafting, and alloy steel bars remain firm. No change is noted in the structural market. Volume holds up and prices of 1.85c. to 1.90c., Pittsburgh, remain unchanged.

Pig iron shipments will be slightly below March figures, owing to the fact that some of the automobile companies are preparing to bring out their new models, which necessitates some changes in patterns.

There have been no changes in prices on old materials in this district during the past two weeks.

Dealers' buying prices per gross ton, f.o.b, cars, Detroit:

Heavy	melting	and	sh	OV	eli	ng			
steel							\$11.00	to	\$11.50
Borings	and sho	rt tur	nin	gs.			7.25	to	7.75
Long to	irnings						6.75	to	7.25
No. 1	machinery	cast					14.00	to	15.00
Automo	bile cast						19.50	to	21.00
Hydrau	lie compr	essed	she	ets	٩.		9.75	to	10.25
Stove	plate						11.00	to	12.00
No. 1 1	busheling						8.50	to	9.00
Sheet c	lippings .						6.00	to	7.00
	gs							to	9.75

"Unusual Features in the Microstructure of Ferrite" is the title of a pamphlet of 68 pages issued by the Bureau of Standards at Washington as No. 571 of its Scientific Papers. The authors are Henry S. Rawdon, senior metallurgist of the bureau, and Torkel Berglund, research fellow Swedish American Foundation, Stockholm.

The Celite Co., Los Angeles, has purchased the plant and property of the National Magnesia Mfg. Co., Redwood City, Cal., and will continue business of latter company under name of National Magnesia Co. Both companies are manufacturers of diatomaceous earth insulating materials and kindred products.

NON-FERROUS METAL MARKETS

The		May 8	May 7	May 5	May 4	May 3	May 2
Week's	Lake copper, New York Electrolytic copper, N. Y.*					14.25	14.25
Prices	Straits tin, spot. N. Y Lead, New York	51.3714	51.12 16		51.62 1/2	51.87 1/2	51.37 1/2 6.10
Cents per Pound	Lead, St. Louis	6.00	6.00	6.00		$\frac{6.00}{6.22\frac{1}{2}}$	
ents per Found	Zino St Louis	5 0 5	5 0014	5 8714	28734	5 8714	5 87 14

Early Delivery

*Refinery quotation: delivered price 4 c. higher.

NEW YORK, May 8 .- Demand is not particularly active in any of the markets; prices are generally strong. Copper is firmer, with a better tone. Tin is steady and moderately active. The lead market is unchanged. Zinc prices are again higher with demand fairly good.

Copper.-A decidedly cheerful tone pervades the market. A fair demand each day is reported for electrolytic copper, with no shading of prices, the quotation being firm at 14.25c., delivered in the Connecticut Valley. Domestic consumers still have considerable metal to buy for May as well as June. The wire makers are again buying more metal and other lines are well booked. Demand from foreign consumers is still good and their needs are not covered for May and All producers are still hard pressed to make deliveries on contracts and as a result there is very little prompt metal available. April statistics are expected to show a marked decline in stocks of refined metal and an increase in deliveries into consumption. Lake copper is in good demand at 14.25c. to 14.37 1/2c., delivered, with buying about equally divided between May and June delivery.

Tin.-Sales for the week ended Saturday, May 5, were about 1000 tons, dealers doing practically all the buying. Consumers have been quite indifferent except for small purchases of spot lots. Spot and May metal is held under close control. Generally the market is featureless. Yesterday, Monday, about 100 tons changed hands and today demand was not heavy. Prices have about held their own with spot Straits tin today quoted at 51.37 1/2c., New York. In London quotations today were higher than a week ago with spot standard quoted at £232, future standard at £231 2s. 6d. and spot Straits at £236 10s. The Singapore price today was £233 5s. Arrivals thus far this month have been 2575 tons, with 5675 tons reported affoat.

Lead .- Conditions are unchanged from last week. Only a moderate demand is reported with some good inquiry for June. Prices are evidently firmly entrenched at 6c., East St. Louis, for the outside market and 6.10c., New York, as the contract price of the leading interest.

Zinc.-In sympathy with an advance of \$1 per ton in ore last week to \$39, Joplin, prime Western zinc is now quoted at 5.95c. to 6c., St. Louis, or 6.30c. to 6.35c., New York. A moderately good business is reported as Producers are not eager having been done each day. sellers and are watching the ore situation keenly. About 15,000 tons was sold last week with production about 10,000 tons, thus reducing the large stocks slightly. Some producers will not sell at less than 6c., St. Louis.

Nickel.-Ingot nickel in wholesale lots is quoted at 35c., with shot nickel at 36c. and electrolytic nickel at 37c. per lb.

Antimony.-The war situation in China is reflected in higher prices in this market where Chinese metal is today quoted at 11.25c. per lb., New York, duty paid.

Aluminum.-Virgin metal, 98 to 99 per cent pure, is quoted at 23.90c. per lb., delivered.

Non-Ferrous Market at Chicago

CHICAGO, May 8 .- This market is quiet except in small and scattered sales. Prices for tin are lower

Non-Ferrous Rolled Products

Mill prices on bronze, brass and copper products are unchanged. Zinc sheets are being quoted at 9c., base, and lead full sheets at 9.75c. to 10c.

List Prices, Per Lb., f.o.b. Mill

On	Copper	and	Brass	Product:	s. Freight up	to
	75c. pe			b. or Or	Shipments	

High brass 18.75c. Copper, hot rolled 23.00c. Zinc 9.00c. Lead (full sheets) 9.75c. to 10.00c.
Scamless Tubes-
High brass
Rods—
High brass
Wire—
Copper
Copper in Rolls

Aluminum Products in Ton Lots

The carload freight rate is allowed to desti-nations east of Mississippi River and also allowed to St. Louis on shipments to destina-tions west of that river. Machine rods

Metals from New York Warehouse

Delivered	Prices	Per	Lb.

Delibered Fraces Fer Lo.
Tin, Straits pig
Tin, bar
Copper, Lake
Copper, electrolytic
Copper, casting14.25c.
Zinc slab 7.00c. to 7.50c.
Lead, American pig 7.00c. to 7.50c.
Lead, bar 9.25c. to 10.25c.
Antimony, Asiatic
Aluminum No. 1 ingots for remelting (guar-
anteed over 99 per cent pure) .25.00c. to 26.00c.
Aluminum ingots, No. 12 alloy 24,00c. to 25.00c.
Babbitt metal, commercial grade. 30.00c. to 40.00c.
Solder, 1/4 and 1/4

Metals from Cleveland Warehouse

Denvered Fraces Fer Lo.	
Tin, Straits pig	
Tin, bar	
Copper, Lake	
Copper, electrolytic14.85c.	
Copper, casting	
Zinc, slab 7.50c.	
Lead, American pig 6.95c.	
Antimony, Asiatic	
Lead, bar 9.25c.	
Babbitt metal, medium grade18.50c.	
Babbitt metal, high grade	
Solder, 1/4 and 1/4	

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

High br	222			18.500	to.	19.25c.	
Copper.	hot rol	led		23.000	to.	24.00c.	
Copper,	cold rol	led, 14	oz. a	nd heavi	er.	26.50c.	
Seamless	Tubes-			20.000	. 10	49.50C.	

Brass 23.37 ½c. to 24.37 ½c. Copper 24.50c. to 25.50c. Brazed Brass Tubes 26.50c. to 27.50c. Brass Rods 16.25c. to 17.25c.

From New York Warehouse

Rolled Metals, f.o.b. Chicago Warehouse

(Trices Cover Trucking to Consumers	Doors in
Sheets— City Limits)	Base per Lb.
High brass	r 25.25c.
Zinc Lead, wide	9.75c.
Seamless Tubes—	
Brass	25.1214c.
Copper	26.00c.
Brazed Brass Tubes Brass Rods	

and quotations on antimony and zinc are higher. The old metal market is quiet.

Prices, per lb., in carload lots: Lake copper, 14.37½c.; tin, 52.25c.; lead, 6.10c.; zinc, 6.05c.; in less-than-carload lots, antimony, 12.75c. On old metals we quote copper wire, crucible shapes and copper clips, 10.50c.; copper bottoms, 9.50c.; red brass, 9.25c.; yellow brass, 7c.; lead pipe, 4.75c.; zinc, 3.25c.; pewter, No. 1, 30c.; tin foil, 36c.; block tin, 45c.; aluminum, 11.75c.; all being dealers' prices for less-than-carload lots.

OBITUARY

ALEXANDER W. COPLAND, president Copland Gear Lapping Syndicate, Detroit, died April 23 at his home

near Birmingham, Mich., aged 60 years. He had formerly been president of the Detroit Gear & Machine Co., Detroit, and was previously manager of the Cincinnati plant of the National Biscuit Co. In the latter position he developed cake baking equipment that is said to have brought about marked changes in previous methods of baking. He served on the truck standardization committee during the world war. For a number of years Mr. Copland had been active in the affairs of the American Gear Manufacturers Association, having served as first vice-president and having been a



A. W. COPLAND

member of the executive committee since 1922. He attended the recent meeting of the association in Rochester, N. Y., only three days prior to his death.

CHARLES D. JONES, superintendent of the Hubbard Pressed Steel Co., Niles, Ohio, died May 5 as a result of injuries sustained when he was struck by an automobile. He was 48 years of age.

Norris S. Rathburn, for several years treasurer of the National Acme Co., Cleveland, died suddenly May 6, aged 50 years. He had retired three years ago because of poor health.

IRA HOBART SPENCER, president of the Spencer Turbine Co., Hartford, Conn., died April 28, at the Hartford Hospital, following a short illness. He was born at Barkhamsted, Conn., 54 years ago. He was considered a leading authority on compressed air machinery and turbines, and during the war served in an advisory capacity for the Government. He was a member of the American Society of Mechanical Engineers.

CHARLES F. KOOPMAN, long identified with the New England Iron Works Co., New Haven, Conn., and its predecessor, the Cunningham Iron Co., died May 1 at

Old Metals, Per Lb., New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators and the selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible Copper, heavy and wire. Copper, light and bottoms Brass, heavy Brass, light Heavy machine composition. No. 1 yellow brass turnings. No. 1 red brass or composi-	11.75c. 10.25c. 7.00c. 6.00c. 9.50c. 7.75c.	13,50c. 12,875c. 11,375c. 8,50c. 7,50c. 10,625c. 9,00c.
tion turnings Lead, heavy Lead, tea Zinc Sheet aluminum Cast aluminum	8.75c. 5.00c. 4.00c. 3.00c. 12.75c.	9.75c. 5.50c. 4.50c. 3.50c. 14.50c. 14.00c.

his home in West Roxbury, Mass. He was born in Freeport, Me., Oct. 11, 1863.

WILLIAM T. EMMES, vice-president of the Boye & Emmes Machine Tool Co., Cincinnati, died May 1 at Good Samaritan Hospital in that city, following a protracted illness. He was born at Winchester, N. H., in 1863 and went to Cincinnati 35 years ago, entering the employ of the R. K. LeBlond Machine Tool Co. In 1898 he became associated as superintendent with Dietz, Schumacher & Boye, which two years later was reorganized as the Schumacher & Boye Co. In 1912 the company was succeeded by the Boye & Emmes Machine Tool Co., Mr. Emmes at that time becoming vice-president and a member of the firm. For the past three years he had been inactive.

John Markey, founder, president and general manager of the National Wrought Iron and Annealing Box Mfg. Co., Washington, Pa., died at his home there May I. He was born in Wolverhampton, England, 62 years ago. His parents came to this country when he was four years old and located in Indianapolis. Mr. Markey started his company at Anderson, Ind., in 1893, but about 20 years ago it was removed to Washington. In 1902 he patented a tin plate annealing box and four years later, a sheet annealing box, which also was patented in England and Germany. He was a director of the Citizens National Bank, Washington, and a member of the American Steel and Iron Institute and the Foreign Trade Council.

EDWARD C. CHAPMAN, machinery dealer at Rochester, N. Y., and representative in that city for the Harding Co., Chicago, died in Rochester on April 14. He went to Rochester 20 years ago, where he became associated with the Davis Machine Tool Co., remaining with that company until it suspended business.

A. M. CAMPBELL, chairman of the board of the Glamorgan Pipe & Foundry Co., Lynchburg, Va., died on May 7. He had been identified with the company for 30 years, having begun as secretary to H. E. McWane, president of the company, and gradually promoted to his late position.

Speedy structural steel erection is reported from Chicago. The skeleton of the new Lawyers Building at 100 North LaSalle Street, comprising 25 stories and basement and requiring 1958 tons of structural steel, was erected in 36 working days. The Gage Structural Steel Co., Chicago, began deliveries of the steel work on Feb. 24 and made the final delivery April 13, and the erection, which was done by the Overland Construction Co., was completed shortly thereafter.

New orders booked during the first quarter of 1928, as reported to the Bepartment of Commerce by 86 manufacturers of electrical goods, were \$244,916,615, compared with \$239,999,298 for the last quarter of 1927 and \$243,651,415 for the first quarter of 1927. The recent figure is the highest since the last quarter of 1926

RAILROAD EQUIPMENT

Virginian to Buy 1000 Car Bodies-Orders for 600 Freight and 100 Sleeping Cars

ORDERS for 300 gondolas for the Chicago, St. Paul, Minneapolis & Omaha, 200 poultry cars for the North American Car Corporation and 100 sleeping cars for the Pullman Co. featured the week's equipment buying. The Canadian Pacific placed orders for 25 locomotives and 11 snow plows. Among the new inquiries were 1000 hopper bodies for the Virginian Railway and 450 freight cars for the Chicago, St. Paul, Minneapolis & Omaha. Details of the week's business follow:

Chicago, St. Paul, Minneapolis & Omaha has purchased 300 general service gondola cars from Siems-Stemble Co. This road has also made inquiry for 200 50-ton flat cars and is expected to buy 250 additional freight cars.

North American Car Corporation has ordered 200 poultry cars from Standard Steel Car Co.

North Western Refrigerator Line will build 100 refriger-

ator cars in its own shops.

Chicago Rapid Transit Co. has withdrawn its inquiry for 50 to 100 motor passenger cars and 50 to 100 trailers. cago, South Shore & South Bend has also withdrawn its inquiry for passenger equipment.

Canadian Pacific has purchased 25 locomotives from American Locomotive Co., through Montreal Locomotive Works, Ltd. This road will also build 11 snow plows and 40 caboose cars at its Angus shops.

Virginian Railway is inquiring for 1900 hopper car bodies

of 57½ tons' capacity. Chicago, Burlington & Quincy is rebuilding 250 ballast cars at its Galesburg, Ill., shops.

Kansas City, Mexico & Orient is expected to make inquiry for 100 box cars,

Amtorg Trading Corporation, New York, has ordered 16 30-ton flat cars from Magor Car Corporation. Pullman Co. has ordered 100 sleeping cars from Pullman

Car & Mfg. Corporation.

Canadian Pacific has purchased five sleeping car underframes from Canadian Car & Foundry Co. and five from National Steel Car Corporation.

REINFORCING STEEL

Two Large Awards Bring Total to 10,700 Tons -5200 Tons in New Projects

WITH foundation work for the Cleveland Union Terminals Co. taking 2500 tons and a highway bridge at New Brunswick, N. J., 2400 tons, awards reported to THE IRON AGE in the last week amounted to 10,700 tons. New projects amounted to 5200 tons, including 2000 tons for a cold storage warehouse at Philadelphia and 1000 tons for a Chicago hotel. Awards follow:

New York, 500 tons of rail steel, piers for Hudson River Bridge, to Truscon Steel Co.

NEW YORK, 250 tons, Spatz Building; from Turner Construc tion Co., general contractor, to Jones & Laughlin Steel Corporation.

NEW BRUNSWICK, N. J., 2400 tons, highway bridge across Raritan River, to Kalman Steel Co.

STATE OF NEW JERSEY, 250 tons, road work; from Joseph

F. Burke, general contractor, to Igoe Brothers.
FORT BENNING, GA., 350 tons, United States Army officers'
quarters, to Connors Steel Co., Birmingham.

UNIONTOWN, ALA., 100 tons, street paving, to Connors Steel Co. CLEVELAND, 2500 tons, foundation and building work for Cleveland Union Terminals Co., to Bourne-Fuller Co. CHICAGO, 500 tons, office building at 301 West Jackson

Boulevard, to Kalman Steel Co.

CHICAGO, 400 tons of rail steel, Foreman National Bank Building, to Inland Steel Co.

CHICAGO, 400 tons of rail steel, building for the Union Carbide & Carbon Corporation, to Inland Steel Co.

STICKNEY, ILL., 800 tons, sewer for Sanitary District, to Truscon Steel Co. STATE OF ILLINOIS, 300 tons of rail steel, road work, to

Calumet Steel Co.

AURORA, ILL., 100 tons, school, to Concrete Engineering Co. St. Louis, 500 tons; 350 tons for two retail stores for Sears, Roebuck & Co. and 150 tons for apartment at 4011 Delmar Boulevard, to Laclede Steel Co.

St. Louis, 100 tons, pumping station at City Sanitarium, to Missouri Rolling Mills Corporation.

SAN FRANCISCO, 400 tons, Kezar Stadium, to Gunn, Carle & Co.

SAN FRANCISCO, 100 tons, firewall for Union Oil Co., to Pacific Coast Steel Co.

OAKLAND, CAL., 120 tons, storm sewer, to Badt-Falk Co. 400 tons, foundation for Capwell store, to OAKLAND, CAL an unnamed San Francisco jobber.

FRESNO, CAL., 100 tons, Teachers College, to an unnamed San Francisco jobber.

SACRAMENTO, CAL, 100 tons, bridge over San Joaquin River at Herndon, to unnamed San Francisco jobber.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the fol-

Boston, 600 tons, Charles H. Tenney Co. office building. PHILADELPHIA, 200 tons, Huntington Street station of Reading Railroad.

PHILADELPHIA, about 2000 tons, cold storage warehouse for Reading Railroad: inquiry not yet issued.

CLEVELAND, 800 to 1000 tons, station building and viaduct for Cleveland Union Terminals Co.

CHICAGO, 1000 tons, hotel at Walton Place and Seneca Street; Levy & Klein, architects.

CHICAGO, tonnage not stated, plant addition for Container Corporation of America.

CHICAGO, 400 tons, Chicago Motor Club building.

URBANA, ILL., 100 tons, Lincoln Hall for University of Illinois.

New Trade Publications

Dust Precipitation Equipment .- General Electric Co., Schenectady, N. Y. Sixteen-page booklet, G. E. A. 916, describing general principles of Cottrell electrostatic process for cleaning blast furnace gas or other industrial smoke, and the special electric equipment required, such as mechanical rectifiers or vacuum tube kenotrons for transforming alternating current into direct current at from 65,000 to 100,000 volts, transformers, switchboards and protective devices.

Welding Supplies .- Lincoln Electric Co., Cleveland. Four-page pamphlet showing cables, shields, electrodes, holders and other supplies for arc welding.

Good Welding Essentials.—Wilson Welder & Metals Co., Hoboken, N. J. Instruction pamphlet (Bulletin E) showing how to maintain short arc, how to test welds, and notes on the strength of welds made under proper

Anti-Corrosive Metal.—American Sheet & Tin Plate Co., Pittsburgh. Twenty-page booklet, profusely illustrated, showing performance of steel containing fractional percentages of copper ("Keystone Copper Steel") when built into railroad cars, when used as corrugated sheets on buildings or for culverts and flumes on irriga-tion projects and when employed for various uses by sheet-metal workers.

Seamless Slip-Joint Pipe.—Otto Kafka, Esperson Building, Houston, Tex. Loose-leaf catalog of 16 pages devoted to "Kaysteel" seamless tubes, which are made by the Mannesmann piercing and pilgering process. The pamphlet deals with the process of manufacture, properties of the material, details of specifications and description of the joint as prepared for welding.

Materials-Handling Equipment.-Revolvator Co., 336 Garfield Avenue, Jersey City, N. J. Bulletin 82 illustrates on one large sheet a variety of equipment for raising and stacking material in warehouses and elsewhere. The raising element may be revolved on its center, operating on ball bearings in a large raceway.

Air Preheater.-Combustion Engineering Corporation, 200 Madison Avenue, New York. Catalog AH-3 of 24 pages, illustrated, describes preheaters for boiler practice and tells of the advantages of heating air to be used for Illustrations include a number of applicacombustion.

Portable Compressors .- Ingersoll-Rand Co., 11 Broadway, New York. Pamphlet of 112 pages illustrating and describing multitudinous uses for portable compressors carried on motor trucks or trailers and employed at various places where compressed air can be utilized to advantage. City streets, mountainous districts, isolated operations of all sorts are included in the examples given.

Pyrometers.-Wilson-Maeulen Co., 383 Concord Avenue, New York. Miniature catalog, reproducing at onequarter size (4% x 5% in. page) the firm's regular large atalog of equipment for recording, indicating and automatic control of high temperatures.



PERSONAL

F. A. Ernst has been appointed assistant district sales manager at St. Louis for the Inland Steel Co.,

Chicago, succeeding W. P. Brumm, who was advanced to the sales managership of the office in August, 1927. Mr. Ernst began his career with the Trumbull Steel Co. in 1914 and has since been associated with the sales departments of a number of companies. Most recently he was in the Chicago office of the American Rolling Mill Co.

George A. Uhlmeyer, industrial engineer Peoples Power Co., Moline, Ill., has been elected chairman of the Tri-City chapter of the American Society for Steel Treating. Other new officers



F. A. ERNST

ing. Other new officers are R. E. McGee, International Harvester Co., Rock Island, Ill., vice-chairman, and Ernest E. Mueller, representative Carpenter Steel Co., secretary-treasurer. The executive committee consists of Earl Taylor, Yellow Sleeve Valve Engine Works, East Moline; E. H. Sohner, International Harvester Co., Rock Island; P. J. Barry, Barry Co., Muscatine, Iowa; Prof. John Fielding, University of Iowa; Fred Turner, Walworth Mfg. Co., Kewanee, Ill.; Hyman Bornstein, Deere & Co., Moline; W. H. Hull, John Deere Harvester Works, East Moline, and E. E. Einfeldt, French & Hecht Co., Davenport, Iowa.

E. B. Whitacre has been appointed superintendent of the Salem, Ohio, works of the American Steel & Wire Co. to succeed the late Robert C. Garrison. Mr. Whitacre has been employed by the company since 1901, having served as machinist and machine shop foreman in the Salem plant until 1915. He then, went to the Trenton, N. J., plant as a master mechanic and in 1921 returned to Salem in the same capacity, retaining that position until his promotion to the superintendency.

Ralph C. Coxhead, since 1921 president of the Ralph C. Coxhead Corporation, New York, distributer in the United States and Canada of the Mercedes calculating machine, has been made vice-president in charge of sales of Veeder-Root, Inc., Hartford, Conn., recently formed by a merger of the Veeder Mfg. Co., Hartford, and the Root Co., Bristol, Conn. He was born at Oakland, Cal., in 1892, and began his business career in 1914 in the sales department of the Dalton Adding Machine Co., Cincinnati. Later he organized the Office Appliance Sales Co. and designed an automatic carriage shift for the Marchant calculating machine. Until 1917 he was employed in various capacities by the Burroughs Adding Machine Co. and as consulting engineer to the Marchant company. During the war he was active in the design of shells, fuses and other munitions, serving in both the United States and France. Following the war he was associated with the American International Corporation as assistant to the president of G. Amsinck & Co., a subsidiary.

Arthur C. Hitchcock, New Departure Mfg. Co., Bristol, Conn., has gone to Europe for a several months' vacation.

M. B. Hoffman, chief metallurgist Colonial Steel Co., Pittsburgh, spoke on April 24 at the dinner meeting of the Tri-City chapter of the American Society for Steel Treating. He gave an illustrated discussion of the general metallurgical terms as applied to both carbon and high-speed steels.

Dr. Robert J. Anderson, director of research Fairmont Mfg. Co., Fairmont, W. Va., producer of aluminum sheet and coil, was elected a vice-president of the company at a recent meeting of the board.

Howard W. Dunbar has been promoted from the position of assistant general sales manager of the Norton Co., Worcester, Mass., to that of works manager of the machine division. He succeeds John C. Spence who recently resigned. Mr. Dunbar will have charge of all production and engineering of his division. He joined the company in 1913 as assistant chief engineer of the machine division.

George N. Jeppson has been elected vice-president of the Norton Co., Worcester, Mass., in charge of production. He has been works manager and secretary of the board of directors since 1919, and will retain the duties of both these offices.

Myron C. Summers, president of the Thomas Sheet Steel Co., Niles, Ohio, at the time of its absorption by the Empire Steel Corporation, heads a new organization which has acquired the Pittsburgh Cold-Rolled Steel Co., Verona, Pa. This company is a producer of cold rolled strip steel with an annual capacity of 7000 tons, and recently has been in the hands of a creditors' committee. Mr. Summers has long been active in steel sales, having been sales manager of the DeForest Sheet & Tin Plate Co., acquired about nine years ago by the Republic Iron & Steel Co. Subsequently he became sales manager Superior Sheet Steel Co., Canton, Ohio, having left that position to become president of the Thomas company about six years ago. This company took over the Thomas works from the Youngstown Sheet & Tube Co., which had acquired it in its purchase late in 1922 of the Brier Hill Steel Co. A. H. Dillon, who has been in the steel brokerage business in Youngstown, is associated with Mr. Summers as vice-president, and D. S. Thomas, new secretary-treasurer, was formerly identified with the sheet steel industry in the Youngstown district.

J. I. Andrews, vice-president and general manager of sales for the American Sheet & Tin Plate Co., has resumed his duties after a two months' European trip.

D. W. Wallace, formerly manager of the Minneapolis branch of the American Cast Iron Pipe Co., Birmingham, has been transferred to the Chicago office of that company, succeeding R. R. Banta, resigned.

Wilbur B. Topping continues as general manager of sales Republic Iron & Steel Co., Youngstown, Ohio, and A. E. Walker as assistant general manager of sales in the reorganization of the sales personnel of the company incident to its formal absorption of the Trumbull Steel Co. James E. Holmes, who has been attached to the New York office of the Republic company, has been transferred to the general offices and will have charge of the steel tube division. The strip steel division is headed by F. H. Loomis, who recently was general sales manager Trumbull Steel Co. Frank Rownd, in charge of Republic sheet sales for several years, has similar duties as head of the sheet division; Walter W. Hall, for several years assistant to Mr. Topping, has been placed in charge of the bar and specialties division, and Avery Adams, formerly assistant general manager of sales for the Trumbull company, heads the tin plate division.

R. W. Wales has been appointed factory representative of the Celoron Co., Bridgeport, Pa., division of Diamond State Fiber Co., and will specialize on molding powders and resins.

George W. Mason has been elected president of Copeland Products, Inc., 630 Lycaste Avenue, Detroit, manufacturer of electric refrigeration machines, succeeding William Robert Wilson, who has been made chairman of the board. Mr. Mason was for a number of years works manager for the Chrysler Corporation, Detroit.

J. C. Ward, president of the Edgar Allen Steel Co., New York and Chicago, sailed from England for the United States on May 2.

Merle W. Pabst has been elected vice-president in charge of sales and purchases for the Mid-State Tools Co., Syracuse, N. Y.

Alfred E. Munch, Jr., has been appointed representative in the Chicago-Milwaukee district of the Rollway Bearing Co., Inc., Syracuse, N. Y., and will have head-quarters at 544 Railway Exchange Building, Chicago.

William J. Serrill, assistant general manager United Gas Improvement Co., Philadelphia, has been elected chairman of the

American Engineering Standards Committee, succeeding C. E. Skinner, chief engineer Westing-house Electric & Mfg. Co., East Pittsburgh, who has held the position for three years. Mr. Serrill has been prominent in the standardizing activities of the gas industry, and, as representative of the American Gas Association, he has been identified with the national standardization movement for several years. Cloyd M. Chapman, consulting engineer, New York, will serve as vicechairman of the Standards Committee during the coming year.



W. J. SERRILL

Will McNamee, for the past three years manager of the Pittsburgh district plant of Briggs & Turivas, Inc., Chicago, at Imperial, Pa., has been placed in charge also of Pittsburgh district sales. He was originally from the company's Chicago organization.

Arthur E. Hodgkins, for several years assistant secretary and treasurer in charge of iron ore sales for Witherbee, Sherman & Co., Port Henry, N. Y., has severed his connection with that firm.

- J. L. Neely, traffic manager American Sheet & Tin Plate Co., Pittsburgh, has retired and Howard H. Smith, assistant traffic manager, has been named to succeed him.
- C. L. Wood, general manager sales Carnegie Steel Co., is back at his desk after an extended European tour.
- J. S. Keefe, president American Steel & Wire Co., accompanied by other executives of the company, is making an inspection tour of the company's plants, his first as president of the company. Plants in Cleveland, Farrell, Pa., and the Pittsburgh district will be visited this week.
- C. B. Gleason has gone with H. T. Gilbert to the Republic Iron & Steel Co. from the Sharon Steel Hoop Co., continuing as Mr. Gilbert's assistant, a position he has held during much of the latter's connection with the iron and steel industry.
- C. Irving Dwinell, recently a sales engineer at Providence for the General Electric Co., Schenectady, N. Y.,

has been appointed manager of the Boston branch of the United States Electrical Tool Co., Cincinnati, which is located at 514 Atlantic Avenue.

H. S. Braman has resigned as a department superintendent of the Youngstown Sheet & Tube Co., Youngstown, Ohio.

Thomas Pritchard has been appointed superintendent of the Girard, Ohio, plant of the A. M. Byers Co., Pittsburgh, succeeding the late William F. Lane. Mr. Pritchard has been with the company 25 years, serving first as chief clerk and later as assistant superintendent.

D. B. Burleigh, sales manager Sundstrand Machine Tool Co., Rockford, Ill., sailed from New York May 4 on the steamship France for a two months' stay in Europe.

Lieut.-Col. Sir William H. Ellis, a director of John Brown & Co., Ltd. (Atlas Works), Sheffield, England, and a past president of both the Iron and Steel Institute and the Institution of Civil Engineers, is at present on a tour in the United States.

H. A. Stamper has been placed in charge of consumer motor sales at New York for the Lincoln Electric Co., Cleveland, and D. F. Titus, recently with the Portland Cement Association, has taken over the direction of welder service for the company in the same city. In the Cincinnati district A. H. Kirkpatrick has succeeded D. W. Carver as manager of welder service, Mr. Carver having been transferred to Cleveland. Consumer motor sales in Cincinnati district have been taken over by H. E. Nelson, formerly associated with the Willys-Overland Co., Toledo, Ohio. At Philadelphia, P. A. Ludwig, recently with Welding Engineers, Inc., has taken over welder service for the Lincoln organization. Forrest Kessler, who has been in the welding time study department at the Lincoln factory, has been transferred to the welder service division at Cleveland. At Chicago, J. R. Rothermel has been placed in charge of welder service, and W. Weaver, of consumer motor sales.

INSTITUTE ELECTIONS

W. L. King Honorary Vice-President and T. M. Girdler and G. M. Verity Directors

Willis L. King, vice-president Jones & Laughlin Steel Corporation, was made honorary vice-president of the American Iron and Steel Institute, at a meeting of the directors, May 7. He resigned as director for the term ending this year, but in his elevation to the honorary position, he retains the privileges of participation in the regular meetings of the directors. He is succeeded as a director by T. M. Girdler, president Jones & Laughlin Steel Corporation.

George M. Verity, president American Rolling Mill

George M. Verity, president American Rolling Mill Co., was elected a director, taking the place of the late Joseph G. Butler, Jr.

The vacancy caused by the death of Judge Gary was filled at an earlier meeting by E. J. Buffington, president Illinois Steel Co.

The other members of the class of directors whose terms expire this year were reelected for the ensuing three years, namely, E. A. S. Clarke, William H. Donner, William J. Filbert, Samuel Mather, Isaac M. Scott, John A. Topping.

The board voted to increase the number of directors from 24 to 30, so that hereafter there will be three classes with ten in each group, each class serving for three years. It is expected that the additional number of directors will be elected by the board at its meeting prior to the semi-annual meeting in New York on May 25

Machinery Markets and News of the Works

LARGE LIST AT CHICAGO

Deere & Co. Inquire for \$500,000 Worth of Tools for Two Plants

General Business in Machinery Continues at About April Rate—Foreign Sales a Feature at Cincinnati

AN inquiry at Chicago for about \$500,000 worth of machine tools for the Moline, Ill., and Waterloo, Iowa, plants of Deere & Co., agricultural machinery manufacturers, is of foremost interest in this week's machine tool developments. Other farm equipment manufacturers who are active buyers of shop equipment are the J. I. Case Threshing Machine Co., Racine, Wis., the International Harvester Co., Chicago, and the Monarch tractor plant of the Allis-Chalmers Mfg. Co., Springfield, Ill.

In the automobile field, buying has tapered off to a considerable extent, yet a fair demand has come within the past week from companies which have contracted to supply parts or accessories for Ford cars. The Logangear Products Co., Detroit, which will make oil pumps for the Ford company, bought about 25 machines from one dealer.

Railroad purchasing has been confined largely to orders of the Santa Fe and Union Pacific against recent inquiries. Small lists have been sent out by the New York Central, Erie, Rock Island and the Oregon Short Line.

In the East, the largest purchases have been made by the General Electric Co. for its Schenectady, N. Y., and Pittsfield, Mass., plants. Some of the textile machinery plants in New England have recently placed fair-sized orders, an interesting development in view of the unsatisfactory conditions which have prevailed in the textile industry.

Foreign sales have been conspicuous in the past few weeks, particularly at Cincinnati, where one company reports that its export bookings in the last 30 days have almost equaled domestic sales. A Cleveland turret lathe manufacturer took an order for four machines to be shipped to France.

The general purchasing officer, Panama Canal, Washington, is asking for bids by May 25 on a number of tools. The Ingersoll Milling Machine Co., Rockford, Ill., is in the market for several machines for a plant addition.

New York

NEW YORK, May 8.

MACHINE tool buying has gradually tapered off since March, but the decline has been gradual. Some New York State dealers did more business in April than in March, but the average was somewhat below the March rate. Since May 1 business has been only fair. Western New York State is quiet, but other sections of the eastern territory are fairly busy. Some good orders have recently come from New England makers of textile machinery. The Erie Railroad has inquired for a half dozen tools, including a 90-in. driving wheel lathe, 20-in. turret lathe, milling machine and a cylinder facing machine. The General Electric Co. has been a fairly large buyer.

Among the week's sales were the following: A Pratt & Whitney No. I A jig borer to an electrical manufacturer in Ohio; No. 2 jig borer to a Cleveland company; 22-in. vertical surface grinder and 16 x 36-in. lathet o an automobile company in Indiana; 13 x 30-in. lathe and 16 x 60-in. lathet o an electrical manufacturer in the East; gear-tooth grinding machine to a company in New Jersey; 4-spindle drumtype milling machine to a motor company in Michigan; 600-lb. steam hammer to a construction company in Birmingham.

Contract has been let by Ramsey Chain Co., Inc., 1031 Broadway, Albany, N. Y., manufacturer of silent chain transmissions, etc., to William Sayles & Son, 266 Hudson Avenue, for a one and two-story plant on Troy Road, to cost in excess of \$450,000 with equipment. E. J. Opie is company engineer; Anthony B. Farrell is president.

Liberty Construction Stone Co., New York, care of Sidney F. Oppenheim, 156 East Forty-second Street, architect, has plans for a two-story plant, 100 x 225 ft., on Longfellow Avenue, near East Bay Avenue, for cutting, polishing, finishing, etc., to cost \$90,000 with machinery.

Board of Education, Ossining, N. Y., plans installation of manual training equipment in new high school on South

Highland Avenue (Albany Post Road), estimated to cost \$750,000, in which amount a bond issue has been voted.

Rumidor Corporation, 500 Fifth Avenue, New York, manufacturer of humidors and other containers, is disposing of stock issue to total \$144,000, a portion of fund to be used for expansion. Richard D. Zucker is president.

Jacob Mark, 51 Chambers Street, New York, is organizing a company to construct and operate a seven-story automobile service, repair and garage building at Seventh Avenue and Union Street, Brooklyn, to cost more than \$400,000 with equipment.

J. Edward Birmingham, 45 Warburton Avenue, Yonkers, N. Y., architect, has taken out permit for a two-story and basement automobile service, repair and garage building, 90×100 ft., at 5120 Broadway, New York, to cost \$100,000 with equipment.

General Motors Truck Co., has removed to its new sevenstory and basement service, repair and sales building at 211-225 West Sixty-first Street, from Fifty-seventh Street and Eleventh Avenue, New York, and will operate motor truck rebuilding and repair plant at new location; each floor totals 20,000 sq. ft. floor space. Divisions will include department for trucks, coachs and cabs, machine shop, unit overhauling department, woodworking division, paint and trim shops, and other mechanical departments. Entire works will represent investment of \$1,000,000. E. M. Seymour is general manager of local branch.

New York Steam Corporation, 280 Madison Avenue, New York, operating steam power plants and system for central heating service in different parts of city, has arranged for bond issue of \$4,000,000, a portion of fund to be used for expansion. James D. Hurd is president.

Reid Ice Cream Corporation, 524 Waverly Avenue, Brooklyn, has plans under way for three-story automobile service, repair and garage building at Waverly and Atlantic Avenues, to cost about \$100,000 with equipment. Kleinert & Klie, 250 Park Avenue, New York, are architects.

Board of Village Trustees, Freeport, L. I., is considering extensions and improvements in municipal power plant, to cost \$250,000 with equipment. Special election is being arranged to approve bonds in that sum.

S. Friedman Co., New York, manufacturer of metal novelties, has leased a floor in building at 575 Eighth Avenue, for a local works.

Board of Education, Monroe, N. Y., plans installation of manual training equipment in proposed two-story high school, to cost about \$165,000, to replace a structure lately destroyed by fire. F. B. Brooks is president, in charge.

Best Mfg. Co., 1200 Grove Street, Irvington, N. J., manufacturer of electrical products, radio equipment, etc., has awarded general contract to Kiegel & Spieler, Irvington, for a two-story addition, 35 x 130 ft., to cost about \$35,000 with equipment. Victor H. Stromback, 1243 Springfield Avenue, is architect.

Board of Education, Oradel, N. J., is considering installation of manual training equipment in three-story junior high school, estimated to cost \$385,000, for which plans will be drawn by Coffin & Coffin, 522 Fifth Avenue, New York, architects.

Gates-Day Aircraft Corporation, Paterson, N. J., recently organized, has leased factory property at 909-29 Twenty-third Street, and will establish plant for manufacture of airplanes and parts. Initial works are reported to cost in excess of \$60,000. Company has also leased property at Teterboro, near Paterson, for flying field. Assets of former Standard Aeoronautical Works, Elizabeth, N. J., have also been secured, and will be consolidated with new company. Ivan R. Gates is president; Charles H. Day, formerly chief engineer of Standard Works, vice-president; and Reuben Reiffin, president, West Paterson Bank, treasurer.

Shenken & Bristel, Newark, have leased a portion of factory at 39 South Sixth Street, and will install a machine shop for production of special automatic machinery and parts.

Board of Education, Summit, N. J., John D. Morgan, president, will receive bids until May 21, for machinery and equipment for woodworking and general shops in junior high school, steel lockers, and other equipment.

H. E. Salzberg Co., Inc., 54 Brook Street, Jersey City, N. J., manufacturer of electrical machinery and parts, has filed plans for new one-story plant, 50 x 215 ft., at Water and Clark Streets, to cost about \$50,000 with equipment.

Quartermaster Department, United States Army, Washington, is arranging for early construction of a group of buildings at Picatinny Arsenal, near Dover, N. J., to replace structures destroyed by an explosion a number of months ago, reported to cost more than \$850,000.

Modern Heating & Engineering Co., 170 Monmouth Street, Red Bank, N. J., has been organized to deal in product of Petroleum Heat & Power Co. Company has machine shop facilities and purchases materials other than Petro equipment in open market.

National Flue Cleaner Co., Inc., Groveville, N. J., manufacturer of soot blowers for return tubular and Scotch marine boilers has appointed following representatives: Walter G. Heacock Co., 30 Union Arcade, Cleveland, and 413 Penobscot Building, Detroit; Jack Deerwester Co., 1621 University Avenue, St. Paul, Minn.; Charles Zinram, P. O. Box 487, Erie, Pa., and Laib Co., Louisville, Ky.

National Oven Co., has removed its general offices from Grand Central Terminal, New York, to factory at Glenham, N. Y.

Atkinson & Utech, Inc., New York, dealer in iron and steel products including forgings and castings, has removed its offices to 117 Liberty Street.

Philadelphia Porcelain Co., Woodlynne, N. J., has been reorganized and plant will be completely revamped within short time. R. A. Weaver is president and R. A. Nelson, secretary and general manager. New furnace and special handling equipment will be installed immediately.

St. Louis

ST. Louis, May 8.

THE Missouri-Kansas-Texas Railway, Railway Exchange Building, St. Louis, is in the market for a 90-in. lathe for journal turning and quartering and crank pin turning. The St. Louis-Southwestern Railway, Buder Building, St. Louis, has purchased from Manning, Maxwell & Moore, a Putnam 90-in. lathe for journal turning and quartering, a Putnam heavy-duty axle lathe, and a Bridgeport floor grinder.

American Yard-O-Meter Corporation, has been organized at St. Louis, to manufacture a fabric-measuring and cost-computing device for retail dry goods stores. Company has authorized capitalization of 1250 shares of preferred stock, \$100 each, and 1250 shares of common no par value stock. Principals in new company are officers of the American

Fixture & Show Case Mfg. Co. Manufacturing plant is at 810 North Tenth Street.

New company is being organized by Frederick E. Kern, Syndicate Trust Building, St. Louis, and associates, to construct and operate new plant on Clayton Road, where site has been secured, for manufacture of special insulating brick, fire brick and other refractories, reported to cost more than \$150,000 with machinery.

Anheuser-Busch, Inc., Ninth Street, St. Louis, is having plans drawn for an addition to power plant at its bottling works, including remodeling of present station and installation of new machinery, reported to cost about \$200,000. Ophuls & Hill, 112 West Forty-second Street, New York, are engineers.

General Airplane Co., Wichita, Kan., M. L. Howe, president, is reported planning establishment of new plant at Muskogee, Okla., for assembling service, to cost more than \$30,000 with equipment.

Shellabarger Mill & Elevator Co., Salina, Kan., has approved plans for new grain elevator with capacity of 1,000,000 bu., reported to cost more than \$350,000, with elevating conveying and other mechanical equipment. Horner & Wyatt, Board of Trade Building, Kansas City, Mo., are consulting engineers.

Airmotor Corporation, Ponca City, Okla., is considering a new one-story plant for manufacture of aircraft equipment, reported to cost close to \$32,000 with machinery.

Union Electric Light & Power Co., Twelfth and Locust Streets, St. Louis, has filed plans for one and two-story automatic power substation at 1408 Clark Street, to cost approximately \$50,000 with equipment.

Seamon-Dunning Corporation, West Fourth Street, Pine Bluff, Ark., manufacturer of automobile bodies, is planning a one-story addition to cost in excess of \$35,000 with equipment.

Swift & Co., Union Stock Yards, Chicago, will install cold storage and refrigerating machinery, and other power equipment, including mechanical handling equipment, in a new meat-packing plant at South Vandeventer and Papin Streets, St. Louis, consisting of three six-story units, to cost approximately \$650,000. John H. Hall is local manager.

Board of Trustees, Kemper Military School, Boonville, Mo., is having plans drawn for one-story addition to power plant, including installation of engine-generator unit, and will soon take bids. Henrici-Lowry Engineering Co., Security Building, Kansas City, Mo., is engineer.

Griffin Brothers, El Dorado, Ark., are planning onestory automobile service, repair and garage building on South Jefferson Avenue, 120 x 300 ft., to cost about \$65,000 with equipment.

Board of Education, Brookfield, Mo., is considering installation of manual training equipment in proposed new high school, estimated to cost \$200,000, for which plans will be drawn by H. D. Pampel, Finance Building, Kansas City, Mo., architect.

City Council, Perryville, Mo., plans installation of pumping machinery and other power equipment in connection with proposed extensions and improvements in municipal waterworks. Bond issue of \$120,000, has been approved for project. Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is engineer.

Central West Public Service Co., Albion, Neb., has secured permission to issue bonds for \$400,000, a portion of fund to be used for expansion and improvements, including transmission line construction.

Ingersoll-Rand Drill Co., 314 North Broadway, St. Louis, has been succeeded by Ingersoll-Rand, Inc., and has opened a new branch at 226 West A Street, Picher, Okla.

New England

Boston, May 8.

NEW ENGLAND machine tool dealers report that business is quieter than during the closing days of April. Inquiries have fallen off, but dealers say they have a large number of quotations out.

The Pneumatic Drop Hammer Co., Boston, is busy. It installed this week four 250-lb. and 300-lb. hammers in a leading Rhode Island jewelry manufacturing plant; has just booked a 900-lb. hammer for an Indiana plant; a cimilar hammer for a Utica, N. Y., manufacturer; two large hammers for an Eastern silverware maker; eight 200-lb. and 300-lb. hammers for Meriden, Conn., manufacturer and has a repeat order for a large hammer from a Providence, R. I., shop.

Some small tool houses did the largest business in April of any month this year, and at least one did more than in any month in more than a year. May, to date, is running far ahead of April.

The Crane Market

THERE is very little new inquiry for either overhead or locomotive cranes. About to close are six %-cu. yd. bucket handling overhead cranes for the Brooklyn Ash Removal Co., 186 Remsen Street, Brooklyn. The Franklin Lumber Co., Newark, N. J., is taking bids on a 10-ton crawl tread locomotive crane and has not yet placed two 15-ton overhead cranes for lumber handling.

In the Pittsburgh district the market is showing much activity. Carnegie Steel Co. will close soon for four cranes for its McDonald, Ohio, works. An order for a 20-ton 66-ft. span crane for Lorain Steel Co., Johnstown, Pa., is pending, and the Diamond Alkali Co. is expected to close soon for a 15-ton, 2 motor, 37-ft. span crane, and for a 1-motor crane for its Alkali, Ohio, works. American Rolling Mill Co. later in the year will want seven or eight cranes in connection with changes at its Butler, Pa., works. Appropriation has been granted for a new skelp mill at National works, National Tube Co., McKeesport, Pa., for which a few cranes will be required. Deere & Co., Moline, Ill., and Waterloo, Iowa, will purchase several overhead electric cranes. Williams, White & Co., Moline, Ill., is in the market for five overhead electric traveling cranes.

Among recent purchases are:

Interstate Palisade Park Commission, Bear Mountain, N. Y., two truck cranes from Browning Crane Co.

- J. J. McGarry, Edgewater, N. J., one truck crane from Browning Crane Co.
- G. W. Corson & Sons, New York, one truck crane from Browning Crane Co.

New Jersey Zinc Co., New York, 1% cu. yd. bucket handling crane from Western builder.

H. J. Heinz Co., Pittsburgh, two 2-ton 2-motor trolleys and one 2-ton 3-motor crane from Northérn Engineering Works.

Bethlehem Steel Co., two 150-ton ingot stripper cranes, one each for Cambria works and Lackawanna works from Morgan Engineering Co.

A. M. Byers Co., Warren, Ohio, two 10-ton gantry cranes from Wellman-Seaver-Morgan Co.

Pittsburgh Coal Washer Co., one 50-ton, 77-ft. span crane from Morgan Engineering Co.

Interest in the crane market centers largely in the Boston & Maine Railroad Co. announcement that maintenance headquarters for work and wrecking equipment, as well as rail motor car equipment, are to be established at Keene, N. H. The car shops there are being enlarged and improved. New hoists of large capacity are to be installed, and the machine shop is to be re-equipped with new tools and appliances. Gasoline rail cars, wrecking cranes, coal cranes, locomotive hoists, ditchers, rail unloaders, ballast spreaders and pile drivers will be repaired there. The company has under consideration a number of wrecking and coal cranes as well as locomotive hoists.

Billings & Spencer Co., Hartford, Conn., tools and machinery, is operating at 100 per cent of capacity. Raw and finished stock on hand are not excessive. Customers are ordering conservatively, but often.

Sullivan Machinery Co., Claremont, N. H., reports its plants in excellent condition and in a position to take care of additional business without additional expenditures for machine tools and other equipment. Invoices for the first quarter of this year were 10 per cent less than for the corresponding period of 1927, but orders on books increased approximately 30 per cent.

New England Fuel & Transportation Co., 250 Stuart Street, Boston, contemplates additions to its Everett, Mass., coke-making equipment.

Taunton-New Bedford Copper Co., North Front Street, New Bedford, Mass., has started a one-story, 20×24 ft. plant addition.

W. A. Stone, State purchasing agent has plans for a repair shop and military equipment storage plant at Concord, N. H., State Camp Grounds. William M. Butterfield Co., 801 Beach Street, Manchester, N. H., are the architects.

Plans are in progress for a four-story sales and service plant addition on Commonwealth Avenue and Melvin Street, Boston, for the Packard Motor Car Co. Alvin Macaulay, 1530 East Grand Boulevard, Detroit, will make the award for construction and equipment.

Baird Machine Co., Stratford Avenue, Stratford, Conn., manufacturer of machine tools, will soon ask bids on general contract for one-story addition, 100 x 150 ft., to be equipped primarily as extension to machine shop, estimated to cost \$75,000. Fletcher-Thompson, Inc., 542 Fairfield Avenue, Bridgeport, Conn., is architect and engineer.

Charles Street Garage Corporation, 252 Cambridge Street, Boston, has plans nearing completion for three-story addition to service, repair and garage building, 80 x 100 ft., reported to cost in excess of \$100,000 with equipment. Lockwood, Greene & Co., 24 Federal Street, are architects and engineers.

Colonial Can Co., 26-28 Pittsburgh Street, South Boston, plans early rebuilding of portion of plant destroyed by fire, April 28, with loss reported at \$50,000, including equipment.

D. M. Watkins Co., Inc., Pine and Foster Streets, Providence, R. I., manufacturer of screw machine products, has filed plans for two-story addition, reported to cost in excess of \$25,000 with equipment. William R. Walker & Son, Providence, are architects.

Connecticut Light & Power Co., Hartford, Conn., will soon begin work on two-story equipment storage and distributing plant on Curtis Street with mechanical repair and parts department, and one-story service and garage

building for company trucks and cars, adjoining, estimated to cost \$200,000 with equipment.

Perry, Buxton, Doane Co., 216 West First Street, Boston,

Perry, Buxton, Doane Co., 216 West First Street, Boston, operating a scrap iron and metal business, has acquired plant and equipment of Tremont Nail Co., Wareham, Mass., exclusive of real estate. The machinery will be dismantled and sold.

United Illuminating Co., New Haven, Conn., is asking bids on general contract for superstructure of its proposed new steam-operated electric generating plant on Grand Avenue. Entire project is reported to cost in excess of \$750,000, with machinery. Westcott & Mapes, New Haven, are engineers. Company has filed plans for one-story automatic power substation on Jackson Avenue, Bridgeport, Conn., to cost more than \$100,000.

Machinery, equipment and real estate of Vermont Machine Co., Inc., Bellows Falls, Vt., will be offered at a public sale on premises, May 17 and 18.

Boston & Albany Railroad Co., South Station, Boston, has filed plans for a new coaling station at 140 Cambridge Street, to cost about \$50,000 with equipment.

South Atlantic States

BALTIMORE, MAY 8.

ONTRACT has been let by Bethlehem Shipbuilding Corporation, Key Highway, Baltimore, a subsidiary of Bethlehem Steel Corporation, Bethlehem, Pa., to Consolidated Engineering Co., 20 East Franklin Street, for second unit of shipyard addition, to be one and two-story, reported to cost in excess of \$400,000, with equipment. Wilson & Tomlinson, 201 Devonshire Street, Boston, are engineers. J. M. Willis is manager.

Baltimore Coach Co., 2 St. Paul Street, Baltimore, has plans for one-story machine and repair shop at 120 West Fayette Street, reported to cost close to \$20,000.

American Chatillon Corporation, 393 Seventh Avenue, New York, recently formed with capital of \$10,000,000, plans installation of power house and machine shop, with other mechanical units, at proposed rayon mill at Rome, Ga. Entire project will cost in excess of \$3,500,000. Lockwood, Greene & Co., 100 East Forty-second Street, New York, are architects and engineers.

General purchasing officer, Panama Canal, Washington, is asking bids until May 25, for turret lathe, screw-cutting lathes, milling machines, drill presses, grinding machines, electric welding machine, hacksaws, wire rope, concrete mixers, etc., Panama schedule 1876.

Ruberoid Co., 95 Madison Avenue, New York, manufacturer of roofing, with main plant at Bound Brook, N. J., has perfected plans for merger with Continental Roofing & Mfg. Co., 1200 South Sixteenth Street, Baltimore, with branch factory at Mobile, Ala.; and P. F. Watson Co., Erie, Pa., manufacturer of kindred products. All present plants will be continued and general expansion program arranged. Each division of consolidated company will maintain identity as in past.

City Council, Florence, S. C., has authorized purchase of tract of 140 acres of land for establishment of municipal airport, and plans early construction of hangars, repair shops, oil storage and distributing building, and other structures. H. K. Gilbert, mayor, in charge.

Starke Foundry & Mfg. Co., Richmond, Va., recently organized by Allen J. Saville, Electric Building, and associates, with capital of \$25,000, is planning operation of local foundry.

Columbus Electric & Power Co., Columbus, Ga., has authorized a note issue of \$2,500,000, a portion of proceeds to be used for expansion, including transmission line construction.

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General Public Service Corporation, Citizens' National Bank Building, Baltimore, Clarence B. Love, secretary, recently organized, is asking bids on general contract until May 15, for one-story fertilizer-manufacturing plant, 80 x 120 ft., reported to cost about \$23,000, with machinery. Howard Borden, Catonsville, Baltimore, is architect.

United States Bureau of Standards, Connecticut Avenue, N. W., Washington, has asked appropriation of \$350,000, for new four-story hydraulic laboratory, with equipment.

Hiner Supply & Mfg. Co., Raleigh, N. C., manufacturer of iron castings, etc., plans rebuilding of portion of foundry recently destroyed by fire with loss reported at \$22,000, including equipment. C. N. Hiner is head.

Arrington Cold Storage Corporation, Arrington, Va., has approved plans for new one-story cold storage and refrigerating plant, reported to cost in excess of \$50,000, with machinery. Ballinger Co., Twelfth and Chestnut Streets, Philadelphia, is architect and engineer. John W. Wheeler is secretary.

Spear Engineers, Inc., Bankers' Trust Building, Norfolk, Va., H. B. Spear, president, is said to be planning a ship-building and repair yard on 15-acre tract of land at West Norfolk, to cost in excess of \$100,000, with equipment.

Forsyth Street Garage Corporation, Atlanta, Ga., care of Pringle & Smith, Norris Building, architects, has asked bids on general contract for two-story and basement service, repair and garage building at Forsyth and Hunter Streets, reported to cost about \$85,000, with equipment.

Nitrate Agencies Co., Wilmington, N. C., operated by W. R. Grace & Co., Murchinson Building, is planning rebuilding of portion of fertilizer plant destroyed by fire, April 30, with loss of about \$150,000, in machinery and supplies, exclusive of building, which was owned by Atlantic Coast Line.

United States Engineer office, Savannah, Ga., will receive bids until May 16, for one 2-cylinder internal combustion engine, circular 132.

City Council, Warrenton, Ga., is asking bids until May 17, for deep-well pumping machinery and auxiliary equipment, steel water tank on elevated steel tower, and accessories, for municipal waterworks. J. B. McCrary Engineering Corporation, Atlanta, Ga., is engineer.

Public Improvement Commission, Baltimore, has authorized Board of Education, Madison and Lafayette Avenues, to purchase 11-acre tract of land on Barrington Road, near Garrison Boulevard, as site for proposed Forest Park high school, to include manual training department. Estimated cost is \$1,000,000. Plans will be prepared under direction of Dr. David E. Weglein, superintendent.

Dr. David E. Weglein, superintendent.

Duke Power Co., Charlotte, N. C., has secured franchise for 100,000-volt transmission line to Marion, N. C., estimated to cost close to \$160,000. W. D. Lee is engineer.

Philadelphia

PHILADELPHIA, May 7.

Contract has been let by Edward H. Reuss, Jr., Thirtieth and Race Streets, Philadelphia, manufacturer of pipe, heating equipment, etc., to Wark Co., 1600 Walnut Street, for one and two-story pipe-bending and fabricating plant at Forty-ninth Street and Gray's Ferry Avenue, to cost close to \$150,000, with equipment. Philip H. Johnson, Widener Building, is architect.

Reading Railroad, Reading Terminal, Philadelphia, has acquired 12-acre tract of land at Nineteenth and Rockland Streets, and Germantown Avenue, for new shop and storage terminal for electric trains, to include repair and reconditioning departments and other mechanical shops. Work will be carried out in connection with electrification program on suburban lines, estimated to cost \$20,000,000.

Simon Scullin, operating an iron foundry at Cambria and American Streets, Philadelphia, has awarded general contract to Knox Landers Co., 1132 Vine Street, for rebuilding of two-story plant, recently damaged by fire. Sentman Motor Co., Fifty-eighth and Walnut Streets,

Sentman Motor Co., Fifty-eighth and Walnut Streets, Philadelphia, has leased a two-story building, 70 x 130 ft., to be erected on Chestnut Street, near Fifty-seventh Street, for a new service, repair and garage building, estimated to cost close to \$100,000 with equipment. Eugene A. Stopper, 10 South Eighteenth Street, is architect.

Philadelphia Rapid Transit Co., 810 Dauphin Street, Philadelphia, has awarded general contract to Henry E. Baton, Inc., 1713 Sansom Street, for a one-story motor bus repair shop, 282 x 406 ft., at Third Street and Hunting Park Ave-

nue, consisting of machine shop, parts department, woodworking department, reconditioning division and other mechanical departments, to cost approximately \$300,000, with equipment.

South Jersey Port Commission, Harold Bennett, 317 Market Street, Camden, N. J., representative, in co-operation with City Council, Camden, has preliminary plans for new marine terminal on Delaware River, between Clinton and State Streets, to cost approximately \$2,000,000, with unloading, elevating, conveying and other equipment. Charles W. Staniford, 50 Church Street, New York, is engineer for commission.

Public Service Electric & Gas Co., Public Service Terminal, Newark, N. J., has filed plans for a one-story power substation on Thirty-second Street, Camden, N. J., to cost close to \$500,000, with equipment.

Board of Education, Elizabethtown, Pa., plans installation of manual training equipment in new two-story senior and junior high school on West High Street, estimated to cost \$125,000, for which bids on general contract will be received on May 14. C. E. Urban, Woolworth Building, Lancaster, Pa., is architect.

Harrisburg Airport Corporation, Harrisburg, Pa., has been chartered by George R. Bailey, Harrisburg, and associates, with capital of \$25,000, to construct and operate local airport, for which site has been acquired. Work will soon begin on hangars, repair shop, oil storage and distributing building, and other structures. Harry T. Neale, Harrisburg, is also interested in new company.

Pennsylvania Power & Light Co., Allentown, Pa., is concluding arrangements for purchase of Harrisburg Light & Power Co., Harrisburg, Pa., and will operate as unit of its organization. Expansion will be carried out in Harrisburg district, including transmission line construction.

Bridgeport Iron Works, Inc., care of W. R. Browne, Powell Street, Bridgeport, Pa., has awarded general contract to Friend-Reiff Co., Norristown Trust Building, Norristown, Pa., for a one-story foundry, 95 x 200 ft., at Church Road and Crooked Lane, Upper Merion, Pa., to cost about \$65,000, with equipment.

Central Railroad of New Jersey, 143 Liberty Street, New York, has work nearing completion on a number of units at its new engine terminal and shops at Bethlehem, Pa., including machine shop, forge shop, wheel works, and other structures. Entire project will cost about \$225,000.

Officials of International Cement Corporation, 342 Madison Avenue, New York, have organized a new subsidiary under Pennsylvania laws, to be known as Lone Star Cement Co., to take over and operate plant of Phoenix Portland Cement Co., Nazareth, Pa., recently acquired. New owner plans expansion in output. International company has also concluded negotiations for purchase of plant and property of Warrior Cement Corporation, Demopolis, Ala., and will operate as a unit of mills in different parts of country, totaling 13. H. Struckmann is president.

Marmon-Philadelphia Co., 847 North Broad Street, Philadelphia, local representative for Marmon automobile, has plans for extensions and improvements in service, repair and garage building at 661-69 North Broad Street, to cost about \$35,000. Clarence E. Wunder, 1520 Locust Street, is architect.

Gill-Virden Co., Inc., Amber and Venango Streets, Philadelphia, manufacturer of illuminating glassware, is closing the plant of former Virden Co., 6103 Longfellow Avenue, S. E., Cleveland, manufacturer of brass and bronze lighting fixtures, recently acquired, and will consolidate the metalworking branch at Philadelphia works, where increased production will be carried out.

Waiskette Mfg. Co., 3240 North Thirteenth Street, Philadelphia, has been organized to manufacture steel wool brush for cleaning and polishing aluminum and other metals. It is in market for steel wool and will also purchase cutters, stitchers and other machinery.

Pittsburgh

PITTSBURGH, May 7.

MACHINERY dealers still are finding business slow, and some report inquiries to be fewer than they were recently. Sales run chiefly to single tools and repair parts. In cranes and heavy machinery business is fairly active and the prospect is bright, with several cranes likely to be placed soon. National Tube Co. has been granted an appropriation for a new skelp mill at its National Works, McKeesport, Pa. Crucible Steel Co. of America has bought a mill to roll alloy sheets at its Park works, Pittsburgh.

Pittsburgh Airways, Inc., 800 Union Trust Building, Pittsburgh, recently organized, has applied for permission to establish and operate local airport, to include hangars, repair shop and other mechanical buildings. It is purposed to operate an airline for passenger and freight service. John D. Shaner is representative.

Weil-McLain Co., Erie, Pa., manufacturer of heating and plumbing equipment, with branch plants at Chicago, and Michigan City, Ind., is disposing of a note issue of \$1,000,000, a portion of proceeds to be used for expansion. Company has recently been making additions to plants.

Board of Education, Altoona, Pa., is planning installation in new West Side junior high school, at Thirteenth Street and Nineteenth Avenue, four-story, estimated to cost \$750,000, for which bids will soon be asked on general contract by Hersh & Shellar, Commerce Building, architects.

Town Council, Romney, W. Va., is asking blds until May 17, for motor-driven pumping machinery and auxiliary equipment for municipal waterworks.

United States Engineer office, Huntington, W. Va., will receive bids until May 14 for iron and steel castings, including cast iron quoins, cast iron bearings and cast steel quoin locks, circular 197. Also, until May 15, for chain wheel and %-in chain, circular 198.

A. M. Byers Co., 235 Water Street, Pittsburgh, manufacturer of wrought iron pipe, etc., is arranging for sale of 125,000 shares of additional stock, to net from \$11,000,000, a portion of fund to be used for expansion and development. Arrangements have been made for renewal of lease and option to purchase plant of American Puddled Iron Co., Youngstown, Ohio, now being operated, from Nov. 1, 1928 to Jan 1, 1930.

Kosmos Carbon Co., Union Building, Charleston, W. Va., is perfecting plans for two new carbon black producing plants in vicinity of Stinett and Sanford, Tex., each of 3-unit type, comprising 18 buildings, reported to cost in excess of \$225,-000, with machinery. Purchases will be under direction of C. A. Urban, company headquarters.

Rust Engineering Co., Rust Construction Co. and Bolivar Clay Products Co., Pittsburgh, have removed their offices to American Bank Building, Sixth Avenue and Grant Street.

Cincinnati

CINCINNATI, May 7.

THE first week of May brought a fair amount of business to machine tool builders, and inquiries indicate that sales this month will be in about the same volume as in April. Most orders are for single tools, and current demand is representative of all parts of the country. The Santa Fe and the Union Pacific have been active buyers in the past 10 days, and several other railroads are expected to purchase small lots of equipment. The New York Central, Southern Pacific and Kansas City Terminal Railroad each is in the market for an engine lathe, while the Boston & Maine is taking bids on two engine lathes. An important manufacturer reports that foreign sales in the past 30 days have been almost as large as domestic bookings. In the Detroit district, automobile makers have bought sparingly, although several orders have been placed by companies having Ford contracts. The Reynolds Engineering Co., Rock Island, Ill., has contracted for a 60-in. duplex control borer.

Contract has been let by Fremont Foundry Co., Fremont, Ohio, to Steinle & Wolfe Co., Crogan Street, for one-story foundry addition on Dickinson Street, reported to cost about \$22,000 with equipment.

American Aggregates Corporation, Greenville, Ohio, recently organized to take over Greenville Gravel Co. and other properties, to specialize in production and distribution of concrete aggregates; manufacture gravel plant machinery and equipment, road maintenance trucks, etc., is disposing of bond issue of \$2,000,000 a portion of proceeds to be used for expansion. F. D. Coppock is president.

Air Corps, Material Division, Wright Field, Dayton, Ohio, will receive bids until May 14, for 35 fuel pressure gages; 100 pressure thermometer gages; 40 oil-pressure gages; 1000 thermometer nuts; and 1000 tachometer shaft washers, circular 324; at same time, for 70 straight-side wheel assemblies, circular 323.

Common Council, Cookeville, Tenn., is considering a bond issue of \$150,000, for extensions and improvements in municipal hydroelectric power plant on Falling Water River.

Edward J. Bosier, Tyler Hotel, Louisville, will take bids at once for proposed three-story and basement automobile service, repair and garage building, 165 x 200 ft., at Third and Guthrie Streets, to cost about \$300,000 with equipment. Company is being organized to carry out project. E. T. Hutchings, 418 South Fifth Street, is architect.

Purchasing and contracting office, quartermaster department, Fort Hayes, Columbus, Ohio, is asking bids until May 21, for two boilers, with accessories, circular 53.

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Southern Cities Power Co., Provident Building, Chattanooga, Tenn., is arranging for a bond issue of \$3,500,000, a portion of fund to be used for purchase of interest in Southern Cities Utilities Co., and for expansion and improvements, including transmission line construction.

American Rolling Mill Co., Middletown, Ohio, has made application for permission to construct and operate a terminal wharf for handling materials at its West Works, Ashland, Ky., to include installation of crane runway and 10-ton electric traveling crane, and other elevating and conveying equipment. Facilities will be provided to handle about 20,000 tons per month.

Board of Public Works, Springfield, Ohio, is having plans drawn for extensions and improvements in municipal pumping plant for water service, to include installation of additional equipment. Eastman & Budke, Springfield, are architects.

Standard Ice Co., Knoxville, Tenn., has filed plans for a one-story ice-manufacturing plant, 86 x 115 ft., reported to cost more than \$150,000, including equipment.

State Board of Education, Nashville, Tenn., has rejected bids recently received for new power plant, in conjunction with science building, at school at Cookeville, Tenn., and will have revised plans drawn and call for new bids, reported to cost in excess of \$175,000.

Common Council, Centerville, Tenn., plans installation of pumping machinery and power equipment in connection with proposed extensions and improvements in municipal waterworks. A special election has been called for May 24 to vote bonds for \$75,000.

The Fountain-Way Corporation, Cincinnati, with a capitalization of \$300,000, has been incorporated to manufacture a new type of washing machine and will erect a one-story brick and concrete factory having 17,000 sq. ft. of manufacturing space at Mariemont Avenue and Trade Street, Westover, a suburb of Cincinnati. Expansion plans of the company call eventually for a two-story building with 160,000 sq. ft. of production area. Gregory T. Desjardins is vice-president and general manager.

Cleveland

CLEVELAND, May 8.

THE demand for machinery in Detroit from shops that have taken orders for parts for Ford cars continues fairly active. A Cleveland manufacturer of turret lathes during the week took single orders in Detroit for six machines for making Ford parts. The business placed by the Logangear Products Co., Detroit, for making oil pumps for Ford cars included about 25 machines bought from one dealer. Locally, the market is rather dull. Most of the business in this territory is coming from manufacturers of automobile parts. A Cleveland manufacturer during the week took an export order for four turret lathes for shipment to Paris, France. The New York Central Railroad is inquiring for a 24-in. lathe, a turret lathe and shaper. Small lists have been issued by the Santa Fe, Rock Island and Oregan Short Line Railroad.

American Electric Switch Corporation, Minerva, Ohlo, is in the market for enipment for the manufacture of pressed steel threadless conduit fittings. Requirements include cadmium plating equipment; power presses for manufacture of collars and hubs; and automatic butt welding machines for joining the hubs to the bodies. Also automatic tapping and threading machinery for the collars and nuts, and automatic surface grinders for the completed fittings.

Air-O-Lator Corporation, Cleveland, has been organized to manufacture ventilating fans. Contracts for motors and frames have been made for one year at which time company will announce future plans which may include building of assembly plant.

C. & G. Cooper Co., Mount Vernon, Ohio, manufacturer of engines and power equipment, has awarded contract for construction of machine and tool building to H. K. Ferguson Co., Cleveland. New building will cost \$60,000 and will replace two former structures.

Group of Warren, Ohio, interests is organizing a \$200,000 company to manufacture steel stampings and pressed steel parts.

General Pressed Steel Co., which is building a plant at Newton Falls, Ohio, expects to get into operation within the next 45 days. Equipment has been purchased.

Chapman-Stein Furnace Co. and Chapman Engineering Co., Mount Vernon, Ohio, have been merged as Charman-

Stein Co. and will continue in combustion engineering field, giving special attention to sale of gas producers, industrial furnaces and allied equipment. Personnel of old companies practically unchanged.

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Plans have been filed by Patterson Foundry & Machine Co., East Liverpool, Ohio, manufacturer of iron and steel products, ceramic machinery, etc., for a one-story addition to East End plant, 110 x 300 ft., reported to cost in excess of \$100,000 with machinery. Richard L. Cawood is president.

W. H. Marlatt, receiver for McGraw Tire & Rubber Co., East Palestine, Ohio, is arranging for sale of plant and property of company at public auction.

Henry & Murphy, Second National Bank Building, Akron, Ohio, architects, have plans for a two-story automobile service, repair and garage building on South High Street, to cost close to \$90,000 with equipment.

Board of Education, Cleveland, is planning installation of manual training equipment in two new junior high schools, each three-story, on sites at Benham Street and East Boulevard, and at Bosworth Street and Parkhurst Drive, respectively, estimated to cost \$700,000, for which bids are being asked on general contract until May 14.

Kilgore Mfg. Co., Uhrichsville, Ohio, manufacturer of cap pistols and kindred specialties, plans rebuilding of portion of plant destroyed by fire, May 2, with loss reported at close to \$30,000, including equipment. Building was owned by Uhrichsville Board of Trade and occupied under

Ohio Water Service Co., Massillon, Ohio, is disposing of bond issue of \$3,000,000, and preferred stock in amount of \$1,173,000, a portion of proceeds to be used for expanin plants and systems, including acquisition of additional properties.

Fire, May 3, destroyed a portion of grain mill and elevator of Carey Mill & Elevator Co., Carey, Ohio, with loss reported at \$100,000, including elevating, conveying and other mechanical equipment. It is planned to rebuild. D. C. Henry is general manager.

Scott & Fetzer Co., 11401 Locust Avenue, Cleveland, manufacturer of vacuum cleaners, etc., has taken out a permit for two-story addition, 43 x 60 ft., for which general contract recently was let to Webber Co., 1609 West Twenty-fifth Street. It will cost about \$45,000 with equipment. A. G. Wolf, Swetland Building, is architect.

Chicago

CHICAGO, May 7.

OF foremost interest in this market is a list for more than \$500,000 worth of machine tools for the Moline, Ill., and Waterloo, Iowa, plants of Deere & Co. J. I. Case Threshing Machine Co., Racine, Wis., and the International Harvester Co. are still actively engaged in making purchases. Allis-Chalmers Mfg. Co. has closed for a number of items for its Monarch tractor plant, Springfield, Ill., and is contemplating adding more equipment at an early date. The Ingersoll Milling Machine Co., Rockford, Ill., is in the market for tools for a plant addition. Dealers are receiving orders against the Union Pacific list; otherwise railroad buying is unusually quiet. Taken as a whole, this market is steady and prospects are that May sales will compare well with those of April.

Bids have been asked on general contract by Illinois Copper & Iron Co., 217 Maplewood Avenue, Chicago, manufacturer of kettles, expansion joints, etc., for a one-story addition, 48 x 100 ft., to cost about \$25,000 with equipment. E. J. Patelski, 179 North Wells Street, is architect.

Combustioneer, Inc., Chicago, recently organized to manufacture automatic coal burners, has leased a one-story factory at 1829-39 South Fifty-fifth Avenue, totaling about 18,000 sq. ft., and will equip for new plant.

Illinois Power & Light Corporation, 231 South La Salle Street, Chicago, is disposing of a preferred stock issue to total \$36,474,000, a portion of proceeds to be used for extensions in power plants and transmission lines. Clement Studebaker, Jr., is president.

Nimmons, Carr & Wright, 122 South Michigan Avenue, Chicago, architects, have plans under way for a 10-story automobile service, repair and garage building in Chicago Beach district, reported to cost in excess of \$400,000 with

Minnesota Power & Light Co., Duluth, Minn., has arranged a fund of \$1,120,400, for extensions and improvements in power plants, power substations and transmission lines during 1928. Additional equipment will be installed in Thomson generating station at Duluth.

Great Northern Railway Co., St. Paul, Minn., has plans under way for a new engine house and repair shops at Grand Forks, N. D., to cost about \$140,000 with equipment. T. D. McMahon, Great Northern Railway Building, St. Paul, is company architect.

Board of Public Works, Cedar Rapids, Iowa, plans installation of pumping machinery and other power equipment in connection with extensions and improvements in municipal waterworks, for which a fund of about \$500,000, is being arranged. Alvord, Burdick & Howson, Hartford Building, Chicago, are consulting engineers.

Building, Chicago, are consulting engineers.

Maytag Co., Newton, Iowa, manufacturer of electricoperated clothes washing machines, is disposing of a preferred stock issue to total \$13,250,000, a portion of proceeds
to be used for expansion. E. H. Maytag is president.

Lapham-Hickey Co., 1625 West Pershing Road, Chicago,
steel products, has acquired property, 160 x 175 ft., at
South Turner Avenue and Forty-seventh Place, and plans
early erection of a one-story and basement storage and
distributing plant, totaling 25,000 sq. ft. floor space, reported
to cost in excess of \$50,000 with equipment.

Container Corporation of America. Inc., 111 West Wash-

Container Corporation of America, Inc., 111 West Washington Street, Chicago, manufacturer of corrugated paper boxes and containers, will have plans drawn for a new mill on Ogden Avenue, for manufacture of paperboard, to cost in excess of \$400,000 with equipment. Walter P. Paepcke is president.

Coleman Lamp & Stove Co., Wichita, Kan., has sold a stock issue in amount of \$1,710,000, a portion of fund to be used for expansion. W. C. Coleman is president.

Belsky Motor Co., Iowa Avenue and Eighth Street, Dubuque, Iowa, has plans for a one-story service, repair and garage building to cost about \$40,000 with equipment. C. I. Krajewski, 730 Main Street, is architect. Great Lakes Paper Co., operated by Backus-Brooks Co., Buildent Evaluation Minneapolity Minn. has disposed of a

Builders' Exchange, Minneapolis, Minn., has disposed of bond issue of \$10,000,000, a considerable portion of fund to be used in connection with a new newsprint mill at Fort William, Ont. Initial unit is now nearing completion and work will soon proceed with a second unit, to be ready for service in about 12 months. A sulphite mill is being built.

American Signs Corporation, Kalamazoo, Mich., has completed installation of porcelain enameling department. Enameling furnace is operated electrically and installation was designed by Ferro Enamel Supply Co., Cleveland.

was designed by Ferro Enamel Supply Co., Cleveland.

Cribben & Sexton Co., Chicago, is installing new Alundum "V" bottom furnace, with special hanging rack equipment, supplied by Ferro Enamel Supply Co., Cleveland.

Black Hawk Brass & Aluminum Foundry, Westfield Avenue, Waterloo, Iowa, has been opened by E. E. and C. P. Foster and will engage in brass, aluminum and bronze foundry work, specializing in new acid resisting metal invented by E. F. Foster.

vented by E. E. Foster.

Arthur L. Stevens Corporation Chicago, has removed from 28 East Jackson Street to Engineering Building, 205 West Wacker Drive.

Chicago office of David Lupton's Sons Co., manufacturer of steel windows, has been removed from Steger Building to larger quarters at 333 North Michigan Avenue. Roy A.

Sanborn is district manager.

O. E. Szekeley Corporation has purchased the factory and foundry of the Burke Engineering Company, Seventh Street, Holland, Mich., and already has begun operations. New equipment has been added to the foundry which includes provision for making brass and aluminum castings.

Link-Belt Co., 329 West Pershing Road, Chicago, will build a one-story factory, 120 x 220 ft., to cost \$60,000.

Hannifin Mfg. Co., 621 South Kolmar Avenue, Chicago, manufacturer of air chucks, will build a two-story factory addition, 75 x 116 ft., to cost \$35,000.

Servel Corporation, Evansville, Ind., manufacturer of electrical refrigeration units, will build a factory addition to cost \$15,000.

Buffalo

BUFFALO, May 7.

Bids have been asked on general contract by U. S. Hoffman Machinery Corporation, 329 Temple Street, Syracuse, N. Y., manufacturer of clothes-pressing machines, parts, etc., for three-story addition, estimated to cost \$70,000, with equipment. Portion of unit will be used as a foundry. Lockwood, Greene & Co., 100 East Forty-second Street, New York, are architects and engineers.

Eastern States Milling Co., Ontario Street and Cloverdale Road, Buffalo, has awarded contract to Monarch Engineering Co., Chamber of Commerce Building, for three-story addition to mill and elevator, estimated to cost \$200,000; installation will include mechanical cleaning, packing and other machinery. C. B. Lee is secretary and general

Consolidated Water Co., Utica, N. Y., is disposing of a bond issue of \$4,000,000, a portion of proceeds to be used

for extensions and improvements in plants and system. operated at Frankfort, New Whitesboro, Deerfield and other points. Franklyn C. Hopkins is president.

Utica Ramp Parking Co., Mayer Building, Utica, has plans under way for multi-story service, repair and garage building at Washington and Oriskany Streets, estimated to cost \$275,000, with equipment. R. S. Westbrook, Utica Bank Building, is architect; C. Kiehm, Gardner Building, is engineer.

Buffalo Foundry & Machine Co., 1543 Fillmore Avenue, Buffalo, manufacturer of vacuum drying machinery, evaporators, etc., has taken over plant and property of Chemical & Vacuum Machinery Co., 1608 Main Street, manufacturer of kindred equipment, and will consolidate with its organization. Expansion in output is being arranged, including production of additional machinery, comprising new design of vacuum rotary dryer, spray film feed, etc. Charles O. Lavett and H. E. Neubauer, heretofore general manager and chief engineer, respectively, of purchased company, will continue with Buffalo Foundry Company.

Rochester Gas & Electric Co., Rochester, N. Y., has filed application with Public Service Commission for permission to use additional property on Geneseo River for proposed extensions in hydroelectric power facilities.

Board of Education, Binghamton, N. Y., installation of manual training equipment in proposed junior high school at Helen and Highland Avenues, estimated to cost \$750,000. T. I. Lacey & Son, Press Building, are architects.

Board of Education, Canandaigua, N. Y., is asking bids on general contract until May 22, for one-story manual arts shop, in conjunction with gymnasium at Canandalgua Free Academy, West Main Street, estimated to cost \$200,000, with equipment. Wilson Potter, 22 East Seventeenth Street, New York, is architect.

Detroit

DETROIT, May 8.

PLANS have been completed by Chevrolet Motor Co., 3044
West Grand Roulevard, Potrait PWest Grand Boulevard, Detroit, for a one-story addition to power plant at local works, reported to cost in excess of \$85,000 with equipment. Albert Kahn, Marquette Building. is architect.

George Bachman, Flint P. Smith Building, Flint, Mich. architect, has plans under way for a three-story automobile repair and garage building at North Saginaw and Wood Streets, to cost about \$130,000 with equipment.

Monroe Auto Equipment Co., Monroe, Mich., is arranging for immediate construction of new one-story plant unit to cost close to \$150,000, and will equip for production of hydraulic shock absorbers, on basis of 500,000 sets per annum. Manufacture will also be increased for self-oiling tire pumps and automobile heater units. C. S. McIntyre is president and general manager.

Board of County Supervisors, Menominee, Mich., has authorized purchase of tract of 100 acres of land north of city for establishment of municipal airport, and will soon have plans drawn for hangars, repair shop, oil storage and distributing building, and other mechanical units.

Copeland Products, Inc., 630 Lycaste Street, manufacturer of electric refrigerating equipment, has leased property adjoining plant, and will arrange for additional facilities to double the present capacity, reported to cost in excess of \$100,000. W. D. McElhinny is vice-president.

Victor Body Co., Lansing, Mich., recently organized by H. Jay Hayes and associates, is establishing a local plant for manufacture of automobile bodies and will begin operations at an early date. H. B. Nelson, formerly connected with Hayes-Hunt Co., at Elizabeth, N. J., will be chief engineer.

Universal Products Co., 6455 Kingsley Avenue, Detroit, I make extensions in machine shop for production of small parts for automobiles, reported to cost about \$40,000, with equipment.

In connection with expansion program at Lansing, Mich., plant, Durant Motors, Inc., 250 West Fifty-seventh Street, New York, will build an addition to power plant, with installation of additional equipment. Superstructure will soon begin on one-story factory unit, 62 x 500 ft., with wing extension 490 ft., and second wing, 400 ft. New strucwill provide about 225,000 sq. ft. floor space, and will develop local plant to production of 1000 cars per day. It will cost more than \$700,000 with equipment.

Plans are under way for a merger of Marvel Carburetor Co., Flint, Mich.; Borg & Beck Co., 310 South Michigan Avenue, Chicago, manufacturer of automobile clutches and kindred products, with main plants at Clearing and Moline, Ill.; and Mechanics Machine Co., Rockford, Ill., manufacturer of automotive equipment. It is purposed to continue all present plants in operation and carry out expansion program for increased manufacture.

Line-O-Scribe, Inc., Adrian, Mich., manufacturer of win. dow-card writing machines, is planning for early removal of plant to larger factory, where capacity will be increased. Company has been leasing portion of local plant of Bond Steel Post Co., which has now been sold to Evans Auto Load. ing Co., which will occupy entire structure.

Motor Camshaft & Parts Corporation, 244 Houseman Building, Grand Rapids, Mich., has been organized to manucamshafts and pistons. Company owns Yassenoff welded camshaft patents and Stungo non-ring piston patents Automobile companies are being licensed to make camshafts under company's patents and within year shafts will b furnished by maker.

Fleckenstein Pump Co., 326 Bond Avenue, Grand Rapids Mich., has been organized to succeed Fleckenstein Visible Gasometer Co. and is manufacturing visible gasoline pumps for filling stations. Company has its own equipment, does its own machine work and purchases raw materials locally and in Chicago market. Company also does jobbing busines in other items used by oil and gasoline distributers.

Milwaukee

MILWAUKEE, May 7.

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Business in machine tools during the past week showed some signs of hesitancy as compared with several previous weeks, but inquiry was well maintained and a moderate number of orders for one or two machines was booked. tive industries are now doing little beyond the making of necessary replacements or changes, although in one or two instances plans call for the purchase of additional tools on a fairly large scale. The power farm machinery industry is still active, although its needs appear largely filled for the present. Payrolls and production schedules of most tool shops continue at the recent peak.

International Harvester Co., 784 Park Street, Milwaukee, has placed general contract with Worden-Allen Co. for construction of brick and steel boiler room building, 65 x 140 ft. Equipment contracts remain to be placed. Paul F. Schryer is general superintendent.

Olsen Mfg. Co., Kenosha, Wis., has been organized by Hans P. Olsen, 501 Cherry Street, Milwaukee, to engage in production of tools, dies, jigs, fixtures and special machinery in plant of former Winther Motor Co., Kenosha, which was acquired recently. Some additions are being made to equipment purchased with factory buildings, and considerable replacement work will also be done. Lester L. Olsen is vice-president and general manager, and Robert E. Bussian, works manager.

Highway Trailer Co., Edgerton, Wis., is making additions to its equipment to facilitate execution of several large orders just booked. American Telephone & Telegraph Co. has placed order for \$600,000 worth of trailers; City of Chicago, \$500,000 for 85 units for rubbish hauling, and City of Cincinnati, garbage trailers valued at \$65,000.

Members of Philip Orth Co., 202 Florida Street, maker of bakery equipment and supplies, have formed Beat-All Corporation, to manufacture similar machinery. Production at first will be centered on variable speed cake-mixing ma-Production at chine with 11/2 hp. Century electric motor. Philip Orth, Jr., is vice-president and general manager.

Madison Gas & Electric Co., Madison, Wis., which is at work on \$500,000 addition to its steam generating capacity, has placed order for 15,000 kw. turbine condenser with the Allis-Chalmers Mfg. Co., Milwaukee. Project is in charge of

Mead & Seastone, consulting engineers, Madison.

Drott Tractor Co., 123 Wisconsin Avenue, Milwaukee, territorial distributer of caterpillar tractors and equipment, has plans by M. Tullgren & Sons, local architects, for \$125, $000\ headquarters$ building for sales and service on Wisconsin Avenue, near Thirty-seventh Street.

Production of steel stanchions, stalls and pens, litter carriers and other steel bran and dairy equipment has been started by Fitzgerald Mfg. Co., in a new plant at Merrill, Manufacture of hardware specialties for wholesale trade is planned during slack seasons in its regular lines. Edward Fitzgerald is general superintendent.

Milwaukee Board of School Directors will close bids May 31 on enlargement and re-equipment of boiler house of Twentieth Street school, estimated to cost \$40,000. M. Harbach is business manager.

Modine Mfg. Co., Racine, Wis., manufacturer of automobile, truck, tractor and industrial gas engine cooling sys-tems, is considering erection of plant additions costing \$100. 000 to increase its capacity about 25 per cent. An architect will be selected shortly. A. B. Modine is president and general manager.

Common Council, Randolph, Wis., is about to request bids for the reconstruction and repair of the municipal steam

generating plant at an estimated cost of \$58,000, for which appropriation has just been made. New boilers, two new generators, switchboard and other equipment is specified. B. C. Keeley is superintendent.

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Hawthorne Building Corporation, 1 South Pinckney Street, Madison, Wis., has engaged Fred L. Kronenberg, local architect, to design an automotive sales, service and storage building on University Avenue, to cost \$125,000. Perry Sletteland is president.

Wisconsin Power & Light Co., Madison, Wis., has acquired the dam site and property of the former Necedah Mill Co. at Necedah, Wis., and plans the erection of a new hydroelectric generating plant to cost about \$100,000.

Badger Meter Mfg. Co., 841 Thirtieth Street, Milwaukee, water meters, has placed general contract with R. L. Reisinger & Co., 484 Oakland Avenue, local, for erecting foundry and carpenter shop addition, 60 x 120 ft., costing about \$65,000 with equipment. C. W. Wright is president and general manager.

Belle City Malleable & Wrought Iron Co., Racine, Wis., has started work on the construction of a plant addition, 60 x 118 ft., at its works at Forest Avenue and Kewaunee Street. Investment will total about \$40,000. Nelson Co., Racine, is general contractor.

Indiana

INDIANAPOLIS, May 8.

BIDS will be received by Common Council, Edinburg, Ind., until May 21, for power house for municipal service, reported to cost about \$23,000. Donald Graham, Hume-Mansur Building, Indianapolis, is architect and engineer.

Indiana Truck Corporation, Marion, Ind., recently merged with Brockway Motor Truck Corporation, Cortland, N. Y., is reported planning a new assembling plant at Atlanta, Ga., to cost in excess of \$100,000, with equipment. Another plant of same character is also projected for Southern district, on site to be selected. Both works are scheduled for completion before close of year.

George J. Mayer Co., Market and Liberty Street, Indianapolis, manufacturer of aluminum and brass plates for automobiles, small metal stampings, etc., has plans for a new addition, designed to double present output, two-story, reported to cost more than \$100,000 with equipment.

Southeastern Indiana Power Co., recently organized to take over electric power business of Indianapolis & Cincinnati Traction Co., Indianapolis, lately secured at a public sale, is arranging for extensions and improvements to cost more than \$100,000,*including transmission line construction. Headquarters will be at Indianapolis. Company will acquire Milroy Light & Power Co., Milroy, Ind., Atwood-Burkett Light & Power Co.; Battle Ground Light & Power Co., and other utilities, and will carry out expansion program.

Davis Industries, Inc., Kokomo, Ind., manufacturer of radio equipment, cabinets, etc., has disposed of a preferred stock issue to total \$341,000, a portion of proceeds to be used for expansion.

Department of Water, Evansville, Ind., will soon take bids for one-story and basement equipment storage and distributing plant at Water and Pine Streets, 70 x 150 ft., with pipe and repair department, garage and service facilities, to cost close to \$40,000, with equipment. John C. Males, City Hall, is secretary. Frank J. Schlotter, Dickman Building, is architect.

Gulf States

BIRMINGHAM, May 8.

CULF STATES UTILITIES CO., Beaumont, Tex., operating electric light and power plants, and ice-manufacturing plants, is disposing of preferred stock issue of \$2,-940,000, a portion of proceeds to be used for expansion, including installation of additional equipment. George H. Clifford is president.

Mississippi Steel & Iron Co., Inc., High and Monroe Streets, Jackson, Miss., plans new plant unit for production of ornamental iron and structural steel products, with output of about 200 tons per month. Equipment purchases will soon be made.

Inland Utilities Co., Kansas City, Mo., has secured a franchise at Blue Mountain, Miss., and plans construction of electric light and power plant, reported to cost in excess of \$80,000 with equipment.

Gulf, Colorado & Santa Fe Railway Co., Galveston, Tex., has approved plans for a new engine house with repair facilities at San Angelo, Tex., in connection with freight terminal. Entire project will cost about \$350,000.

Southern States Power Co., Marianna, Fla., is arranging an expansion and improvement program to cost about \$100,-

000, including new steam-operated electric power plant on Jefferson Street.

Planters' Cotton Oil Co., Yazoo City, Miss., has authorized plans for complete electrification of its plant, and will soon begin installation of equipment.

Texas Cities Gas Co., El Paso, Tex., recently organized as a subsidiary of Union Utilities, Inc., to operate gasmanufacturing properties, is disposing of a note issue of \$2,500,000, a portion of proceeds to be used for purchase of existing gas generating stations and installation of additional plants. H. G. Scott is president.

Board of Education, Panhandle, Tex., plans installation of manual training equipment in new two-story high school, estimated to cost \$140,000. Butler Co., Hersh Building, Oklahoma City, Okla., is architect.

West Texas Gas Co., Amarillo, Tex., operating natural gas properties, is said to be planning additions in pipe lines to total close to 100 miles for service at Tahoka, Lamesa, Stanton, and vicinity, reported to cost more than \$325,000 with equipment.

Florida Power Corporation, St. Petersburg, Fla., is considering a new steam-operated electric power plant on Monroe Street, Mayo, Fla., with Diesel engine installation, reported to cost more than \$65,000. An ice-manufacturing plant is also planned at same place.

Board of Education, Fairfield, Ala., plans installation of manual training equipment in new three-story high school, estimated to cost \$200,000, for which bids are being asked on general contract until May 16. Denham & Denham, Comer Building, Birmingham, Ala., are architects.

Board of Public Works, Baton Rouge, La., will take bids early in June for new pumping plant in connection with extensions in sewage system; project will cost about \$180,000.

Chadwick Machinery Co., 125 Blue Star Street, San Antonio, Tex., has been organized to deal in machinery, supplies and construction equipment and is handling accounts of Barber-Greene Co., Aurora, Ill.; Chain Belt Co., Milwaukee; Northwest Engineering Co., Green Bay, Wis., and Sullivan Machinery Co., Chicago.

Pacific Coast

SAN FRANCISCO, May 5.

WORK has begun on two one-story additions to plant of Moreland Truck Co., Burbank, Cal., 30 x 100 ft., and 60 x 75 ft., reported to cost about \$50,000. T. E. Young is superintendent in charge of erection.

Great Western Power Co., 530 Bush Street, San Francisco, has concluded arrangements with county for closing of certain streets in Hunter's Point section, to provide site for its proposed steam-operated electric power plant. Initial unit is estimated to cost \$4,000,000, and ultimate station, \$15,000,000, including transmission lines.

Puget Sound Power & Light Co., Seattle, has arranged for sale of block of preferred stock to total about \$10,560,000, a portion of proceeds to be used for extensions and improvements in power plants and system. Company is reported planning increase in present hydroelectric power facilities.

Northwestern Air Lines Co., 515 Puyallup Avenue, Tacoma, Wash., A. O. Berg, head, plans development of airport on 90-acre tract of land at Parkland, vicinity of Tacoma, including hangars, machine repair shop, oil storage and distributing plant and other mechanical buildings, reported to cost in excess of \$50,000.

San Diego Consolidated Gas & Electric Co., San Diego, Cal., has begun expansion program at power station B, to increase capacity from 35,000 kw. to 63,000 kw., reported to cost more than \$1,000,000 including machinery and transmission line extensions. Company is under direction of Byllesby Enginering & Management Corporation, 231 South La Salle Street, Chicago.

Oregon-Washington Railroad & Navigation Co., Portland, has authorized fund of \$133,000 for extensions and improvements in car and locomotive shops on different points of line; also, an appropriation of \$1,430,000 for new equipment, including rolling stock.

Merger of the Grays Harbor Iron & Machine Works, Aberdeen, Wash., with Lamb Machine Works, Hoquiam, Wash., has been announced. Fred H. Lamb, head of the latter company, acquired the controlling interest in the Aberdeen plant. Officers of the consolidation are: Frank H. Lamb, president; I. W. Johnson, vice-president; M. T. Thorpe, treasurer, and George E. Lamb, secretary.

The H. J. Armstrong Co. of Oregon has been succeeded by the Pacific Equipment Corporation, capitalized at \$199,000. Offices are in the Board of Trade Building. E. M. Ricker, formerly owner of the Ricker Machinery Co. of San Francisco, is president of the new company; Z. A. Toye is vice-president and general manager, and H. J. Armstrong, Seattle, is secretary. The company will specialize in purchase and sale of all kinds of equipment for construction and logging industries.

R. L. Balzer Machinery Co., Portland, Ore., has taken office and warehouse space at East Sixth and Market Streets, that city. Mr. Balzer was formerly manager of the Clyde Equipment Co. In his new business he will handle the Gardner-Denver line of road machinery and Ohio locomotive cranes.

Canada

TORONTO, ONT., May 8.

INK-BELT, LTD., Eastern Avenue, Toronto, Ont., has had plans prepared by Ewart, Armer & Bam, Excelsior Life Building, Toronto, for a \$10,000 addition to its foundry at Elmira, Ont.

Simmons, Ltd., 400 St. Ambrose Street, Montreal, Que., manufacturer of beds, etc., will build an addition to its plant and is calling for bids.

F. Robb, 1111 Beaver Hall Hill, Montreal, Que., has prepared plans for a factory on Smith Street, for Henderson & Barwick, 5 Olier Street, manufacturers of elevator buckets, coal chutes, etc.

Standard Brick Co., Ltd., Greenwood Avenue, Toronto, Ont., is having plans prepared by E. G. Wilson, 42 Langley Avenue, for the erection of boller room, engine house and dry kiln.

Toronto, Hamilton & Buffalo Railroad will spend \$1,000,000 on a development scheme at Hamilton, Ont., according to H. T. Malcolmson, general manager. Modern engine terminal will replace the present one, and a substantial share of the expenditure will go into the purchase of machinery and other equipment. A 25-ft. stall roundhouse, 110 ft. deep, with a serving turntable of 100 ft. is planned. Buildings to be erected include a roundhouse, power house, coaling plant, locomotive repair shop, brick storehouse and a huge water tank.

The Kitchener Ornamental Iron Co., Kitchener, Ont., has purchased a site of five acres on Guelph Street, and will start work immediately on the erection of a foundry to cost \$75,000. Equipment for the plant will cost \$65,000, bringing the total expenditure up to \$140,000. The company which will manufacture ornamental iron including bank fixtures, stairways, and building equipment, expects to be operating within three months. Those interested in the new company include: A. W. Law, Detroit, W. G. Weichel and August Frank, Kitchener.

Western Canada

Bids will be received by J. W. Johnston, secretary-treasurer, Dauphin, Man., until May 19, for equipment for power plant including water tube boilers, turbo alternator, condenser and complete electrical equipment. Consulting engineer, N. M. Hall, Engineering Building, Sherbrooke and Portage Avenue, Winnipeg, Man.

Business men of Vancouver, B. C., have subscribed \$100,-000 towards the project of Senator Charles G. Heifner of Seattle, Wash., whose present address is Devonshire Apartments, Vancouver, to establish a pulp mill on Poplar Island, B. C. Charles Maravec, 2535 Seventh Avenue West, Vancouver, is also interested in the project, which will cost approximately \$450,000.

Foreign

BOND issue of \$4,000,000, is being sold by Ruhr Chemical Corporation, (Ruhrchemie Aktiengesellschaft), Berlin, Germany, considerable portion to be used for new plant in Ruhr district for production of ammonia, nitric acid, fertilizer, etc., reported to cost close to \$5,000,000 with machinery. Initial unit scheduled for completion early next spring. Dr. Fritz Mueller is head.

Ulen & Co., 120 Broadway, New York, in cooperation with Holtzman, Beger and Siemens interests, Berlin, Germany, have contracted with Persian Government for construction of a railroad from Bender Abbas, on Persian Gulf, to a port on Caspian Sea, including locomotive and car repair shops, rolling stock, etc.; entire project is estimated to require from seven to eight years for completion, and will cost \$100,000,000.

Power company in England is arranging for construction of a new electric light and power plant, with transmission system, on Island of Jersey, estimated to cost \$1,200,000. Information at office of Bureau of Foreign and Domestic Commerce, Washington, reference England No. 66028; also, at American Consulate, London, England, William L. Cooper, commercial attaché.

American & Foreign Power Co., operated by Electric Bond & Share Co., 2 Rector Street, New York, has secured a controlling interest in Mexican Utilities Co., and its subsidiaries, Central Mexico Light & Power Co., and Guanajuato Power & Electric Co., operating in central part of Mexico. New owner plans expansion and improvement program, including increase in power facilities and transmission lines.

THE LAST WORD

(Contributed by the Reader Service Department of the Iron Age Publishing Co.)

A COLORED preacher was describing the wonders of the hereafter. "You all is seen molten iron runnin' out fum a furnace, ain't you?" he asked.

The congregation silently assented.

"Well," continued the preacher, "in de place what I'm talkin' bout dey uses dat stuff fo' ice cream."

For the business long jump contest our entry is A. F. Hartranft, who has been with the Reading Iron Co. for a great many years. He recently resigned to engage in the manufacture of men's handkerchiefs.

Are automatic machinery and highly specialized jobs slowly exterminating the old-time machinist, who raised his trade to the status of a profession? The fact that of 427 members of the National Metal Trades Association, 88 or more than 20 per cent reported a shortage of skilled machinists strikes us as significant.

Apparently boys are not being raised to be machinists. When the law of supply and demand begins to exact its toll, those far-sighted youths who have elected to learn the secrets of the "mike" will be high-hatting their bond-selling brothers.

No, Waldo, the spark plugs these gentlemen are tossing into the ocean, used and recommended by Lindbergh for transatlantic flying, are not for the new



model electric eels. They are discarded spark plugs, purchased from service stations, refurbished, and sold again under the original brand names, as "reconditioned."

The manufacturers of "AC" and "Champion" plugs brought suit against the ingenious gentlemen who conceived the idea. And the judge told the i.g. that they could sell the plugs but that they would have to remove the brand names. "But then we couldn't sell them," he was naively told. Did the judge burst into tears over the plight of the defendants? No, instead he suggested coldly that they go into an honest business.

Write your own moral.

A manufacturer whose letterhead bears the legend, "Cinderella Kiddy Clothes—Children's Dresses, Boys' Suits, and Creepers," writes for a copy of The Iron Age. He may be thinking of putting on a sideline of children's armor for sale in certain of our large cities.

Who is the oldest Iron Age subscriber? H. L. Green, Chicago steel merchant, writes, "I wish you would look up and see if we are not just about the oldest continuous subscriber you have in these parts. Before coming to Chicago in 1882 we were taking The Iron Age in Milwaukee under the name of Starkweather & Co."

Since 1855 our headquarters have been moved several times, and our old circulation lists are not complete. How long have you been a reader? Our address is 239 West Thirty-ninth Street, New York.

A. H. D.